



Minds sketch

Your partner in mental stability

Daniël de Goederen

1847775

d.x.d.goederen@student.tue.nl

Reijer Koudenburg

1794388

r.j.koudenburg@student.tue.nl

Elif Özyasar

1777920

e.ozyasar@student.tue.nl

Project coaches

Rick Knops

Olaf Adan

Steven Houben

Abstract

Lack of emotional expression and reflecting on emotions can be harmful to the mental wellbeing of young adults. During this phase of their life, it is often harder for them to express their emotions, studies show that 29% of students experience poor mental health [1]. These people can find it hard to express themselves to others, especially with words. The goal is to make emotional expression simple and more accessible to young adults between the age of 18 to 26 who struggle with emotional expression. Mindsketch allows users to express themselves through drawing. It is a creative and abstract form of expressing oneself, while using AI generated images as a form of inspiration to take aspects of these images for their own creative drawing. Mindsketch allows users to reflect on their emotions in a creative and personal way which can help them maintain a healthy mental wellbeing.

Key words

Art, reflecting, emotional expression, mental well-being, artificial intelligence

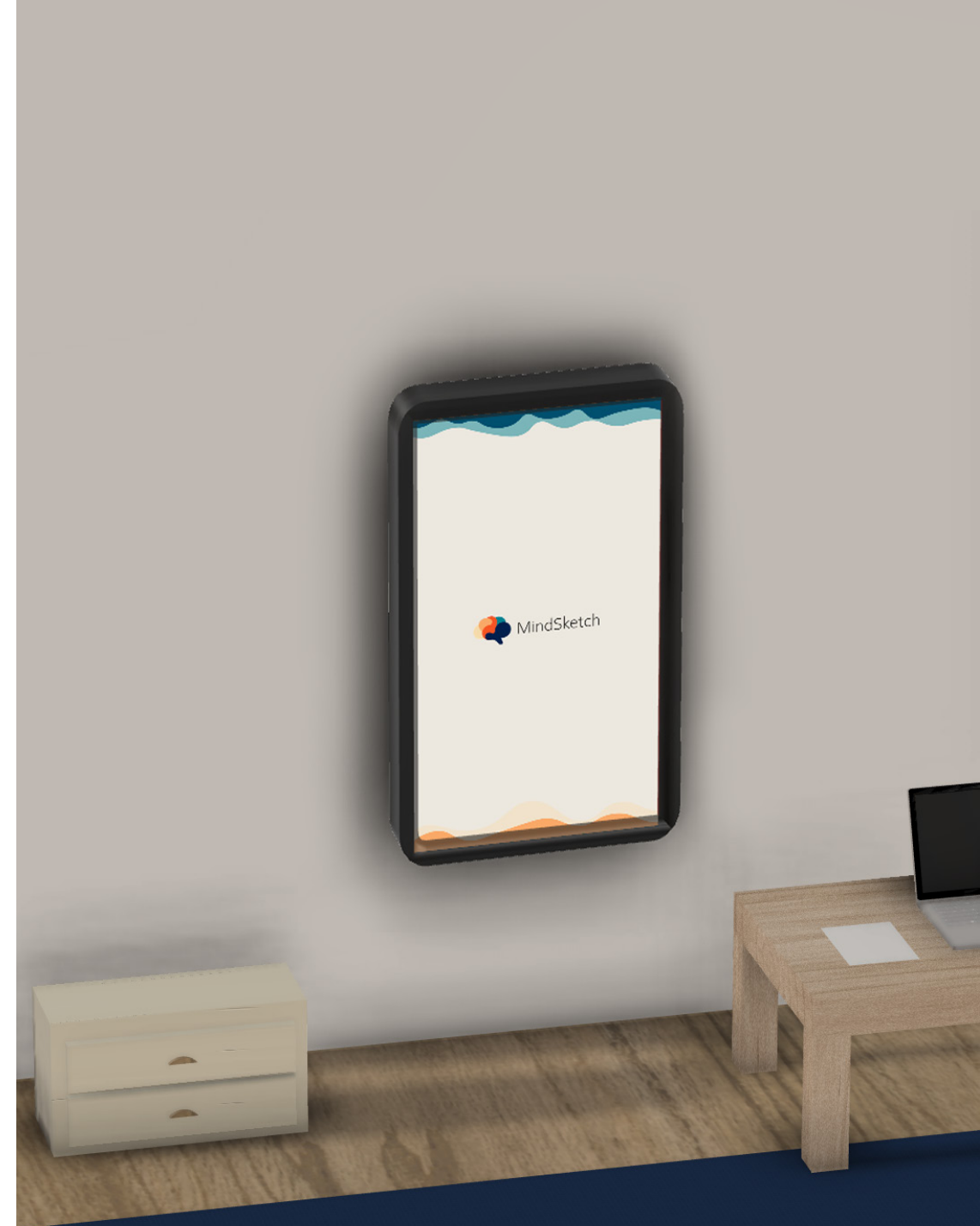


Figure 1: 3D render of final iteration

Introduction

In today's increasingly demanding world, young adults are struggling with higher levels of stress and emotional turbulence than ever before [2]. What is concerning is the suppression of these emotions among young adults [3], especially students, as Centers for Disease Control and Prevention (2021) [4] show that more than 42% of students feel "persistently sad or hopeless" and around 29% is said to experience poor mental health. Bottling up these emotions carries significant consequences, such as depression or anxiety disorders [4,5]. This is why it becomes crucial to explore the impact of emotional suppression and highlight the need for opening up, to be relieved of these negative emotions. This report aims to investigate, understand and propose a solution for the need for action on the effects of emotional suppression on mental health.

Our approach allows users to express themselves, relieving them from emotional suppression with the use of drawing. Research from Gómez-Restrepo et al. (2022) [6] shows that creative activities like drawing "are a resource for overcoming negative emotions such as anxiety, depression, and sadness". Furthermore, insights from a paper by Ford et al. (2018) [7] also state that "Research has consistently linked the habitual tendency to accept one's mental experiences with greater psychological health", supporting that reflecting on your emotions is beneficial for one's mental well-being.

The contribution this project aims to make is to take care of the mental well-being of young adults by providing a tool that encourages emotional expression. In addition, the primary objective of this project is empowering individuals to express their feelings, confront emotional barriers, and develop healthier coping mechanisms. This raises the question: What influence does AI guided drawing have on the emotional expression of young adults?

In summary, this report delves into the issue of emotional suppression among young adults, proposing a solution that aims to transform emotional expression and, subsequently, enhance mental wellbeing. In doing so, the proposed enhances the mental stability of this demographic.



Related work

A short explanation can be found in figure 2.

AI powered Mental health/emotional wellbeing

Woebot and Headspace

94% of first-time users reported a positive impression of Woebot's psychoeducational content. However, it is important to state that Woebot is not approved by FDA and it does not replace clinical care [8]. Nieva et al. [9] tested the effectiveness of Woebot with senior high school students and found sufficient evidence to conclude that the stress levels of the participants lowered after using Woebot, 72% of the participants gave above-average satisfaction ratings. However, a major concern repeatedly raised by the participants and the psychologist was the misalignment of Woebot's responses to the user input.

According to their website [10], Headspace resulted in 29% decrease in depressive symptoms and 19% decrease in anxiety after 8 weeks. However, clinical psychologists caution people against using AI to replace professional therapists and state that they can create serious outcomes[11].

Art and emotional expression

Art therapy

Fiona Yassin, a psychotherapist states that [20] through the creation of artwork, young people can begin to represent their thoughts and emotions which can be hard for them to express verbally.

According to Abbing's clinical trial [21] art therapy may reduce a person's anxious feelings and enable them to focus on positive things for some time. Studies that were examined in this research included participants aged between 18-65 and it is mentioned that art therapy may be beneficial for all age groups.

In conclusion, art shows significant potential in the field of mental well-being. It can possibly investigate emotions and cognitions, contributing to cognitive regulation [22]. However, existing studies have a high risk of bias, and small to moderate sample size in terms of solving clinical mental health problems[21]. Shukla et al.[18] also suggested that there is a need for more high-quality trials with relevant outcome measures.

Other limitations of art therapies are that they can be time-consuming, require commitment and expensive. The expense associated with art therapy should be taken into account when considering this form of therapeutic intervention [23]. When it comes to target groups of students and young adults these limitations can create problems regarding accessibility as students usually struggle with managing their time and finances.

Benchmark of AI and art therapy apps

Mindpalette

Mindpalette [24] is an ongoing project and the study has not been released as a paper yet, the app is not published. This project was encountered at the end stage of the design process but shows valuable research that validates the concept of Mindsketch. Mentioned papers in the research of Mind palette state that Art and drawing can elicit positive emotions through the exploration of intriguing subjects, and active engagement through planning and self-expression, contributing to the concept of Mindsketch.



AI-ert

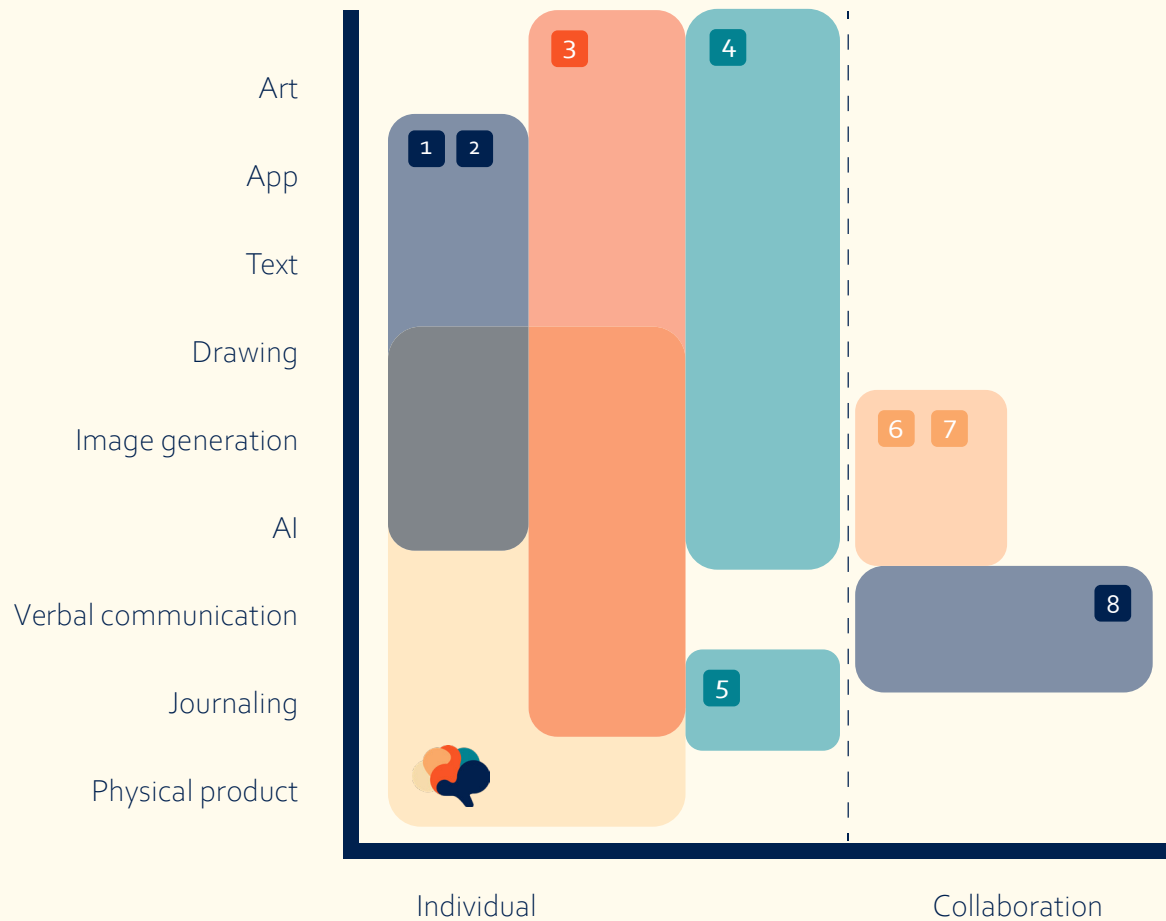
This project [24] was also encountered at the end stage of the design process of Mindsketch. Insights that came from the user interviews indicated that Journaling can be burdensome. Users also expressed conflict of wish to share and be alone. We have also faced this situation while developing Mindsketch therefore created a journaling mode that users can share with others if they prefer. Yoo states that people exposed to AI-generated image + text experienced three times greater improvement in alexithymia than the text-only group. Alexithymia

Inspiration for drawing

Chiaki Ishiguro et al. state that drawing inspiration from others' artworks is one of the key processes of artistic creativity. Active art appreciation inspires people and facilitates the creativity of artmaking[25]. There have been products developed to help people's creative process by providing them with visuals. Existing works on this concept were researched while finding ways to provide inspiration to users of Mindsketch.

The results of the user study show that IdeaWall effectively presented visual cues to facilitate verbal creative collaboration for idea generation. IdeaExpander was also concluded to increase individuals' idea production. These findings contribute to Mindsketch as AI-generated images will be used to help people with inspiration. This project explores the benefits of visual cues in a group.





Graph 1: Overview of related benchmark studies

- 1 Woebot is an AI-powered mental health application [8]. The AI engages in conversation with users, aiming to help overcome depression and anxiety and control emotions.
- 2 Headspace [10] aims to achieve similar results to Woebot by offering meditation, mindfulness exercises, and mental health coaching.
- 3 AI-ert [24] is an application designed by Daeun Yoo for reflecting on emotions through AI generated art. Users select their feelings, give explanations of the situation and they receive art recommendations that they can use as a base for their drawings
- 4 Mind Palette [24] is a mobile app designed by Daeun Yoo that incorporates art therapy methodologies and generative AI technology. The application provides art recommendations and chatbot interactions to facilitate discussions about emotions also encourage self-expression through art creation.
- 5 There is variety of AI-powered journaling apps such as Jumble Journal, Reflectly, Mindsera and Rosebud[12]. These apps use AI to analyze patterns in entries, and emotions and can also provide mood check-ins and daily journal prompts. According to research, journaling can help us accept our mental experiences, resulting in fewer negative emotions in response to stressors [13,14].
- 6 IdeaWall is a real-time system that provides visual stimuli to the users to facilitate their creative process in meetings [26]. Ideawall extracts information from a verbal discussion and visualizes it with web-search materials.
- 7 Ideaexpander [27] shows pictorial stimuli based on conversational content. It is a tool to support group brainstorming by intelligently selecting pictorial stimuli based on the group's conversation. The design is based on theories of how perception, thinking, and communication interact
- 8 Art therapy is a method that uses creative and artistic processes to help people explore self-expression, and self-awareness and cope with stress [17]. Shukla et al. [18] states that art therapy can help people express themselves more freely and can assist people in transforming negative feelings into positive ones[19].

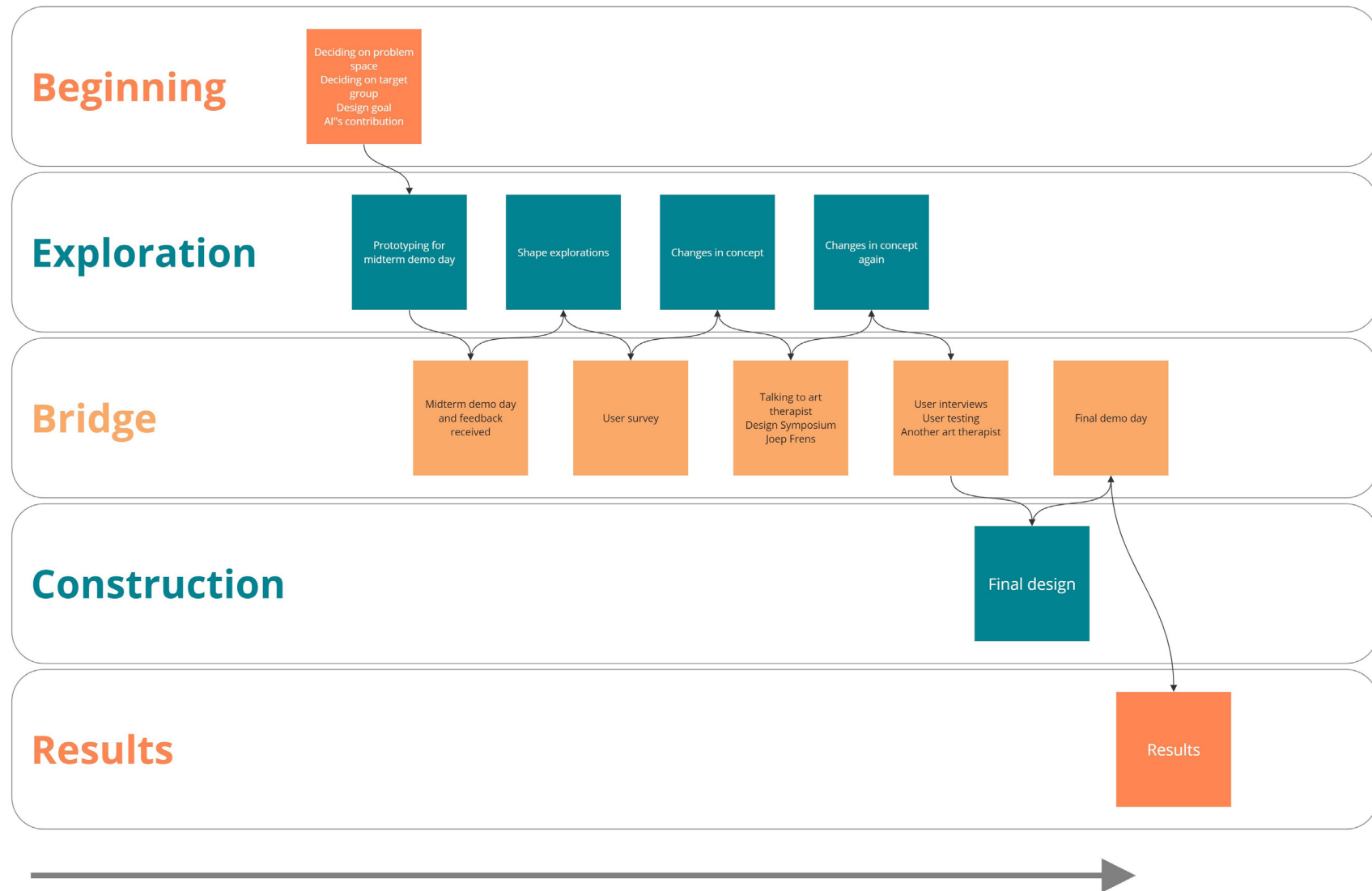


Design process

The structure of the design process followed the design odyssey framework. As Ryan Ford states, the process started with an idea in mind. However along the journey we got side-tracked, interrupted, feedback pushing us back and just learning many theoretical ideas would prove not to be successful when testing and discussing with experts [28]. This framework better reflected our work rather than the famous double diamond as our process was not linear, like the Design Odyssey framework, overlaps and cycles back on itself. Our process was non-linear, the design odyssey reflects this as each phase overlaps back on itself, for each next iteration we used concepts from our previous one. The final iteration even had many aspects of our first design, which will be mentioned later. As can be seen in figures 2,3 on the next pages we went back to the beginning phase for every iteration going through each stage again to reconstruct and test our concept.



Visualization of design process



Time

Figure 2: Visualization of design process using the Design Odyssey framework

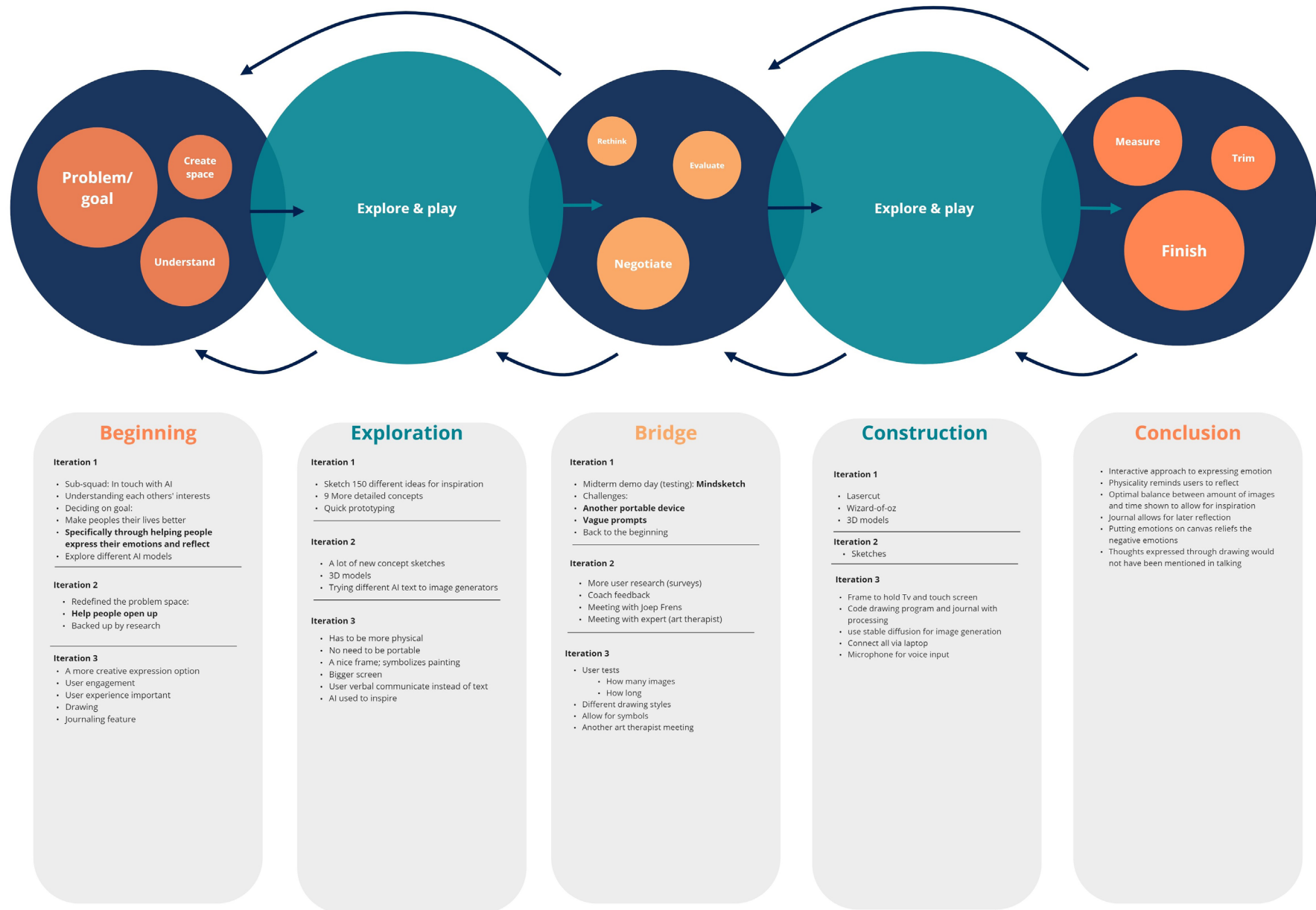


Figure 3: All phases of design Odyssey framework

Beginning phase 1

As the beginning phase of the design odyssey framework, the design process started with broad explorations of fields where AI could create opportunities. A lot of ideas were explored through sketches as seen in figures 4,5 and by categorizing AI models as seen in figure 6. As a mutual vision of the team members, ways of using AI to make people's lives easier were decided to be the main brainstorming topic. Explorations were done in various areas such as helping people with daily tasks as can be seen in figure 7. However, this way of approaching the design process made it challenging to decide on the design goal. Therefore, it was decided to first focus on determining the problem space, and then looking for the possibilities of AI. After going over the ideas, the group decided on a topic that all members were interested in, helping people maintain their mental wellbeing by expressing and reflecting on their emotions.

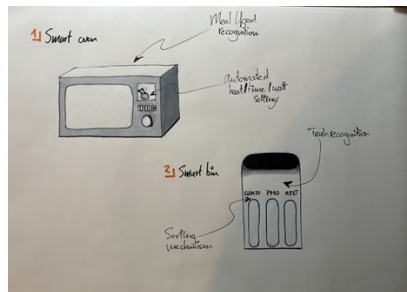


Figure 4: Sketch of smart microwave

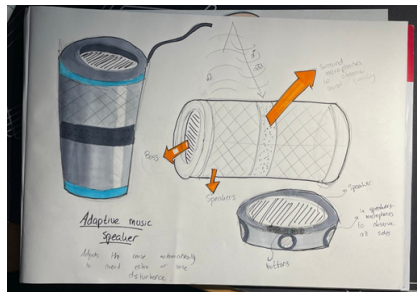


Figure 5: Sketch of smart speaker

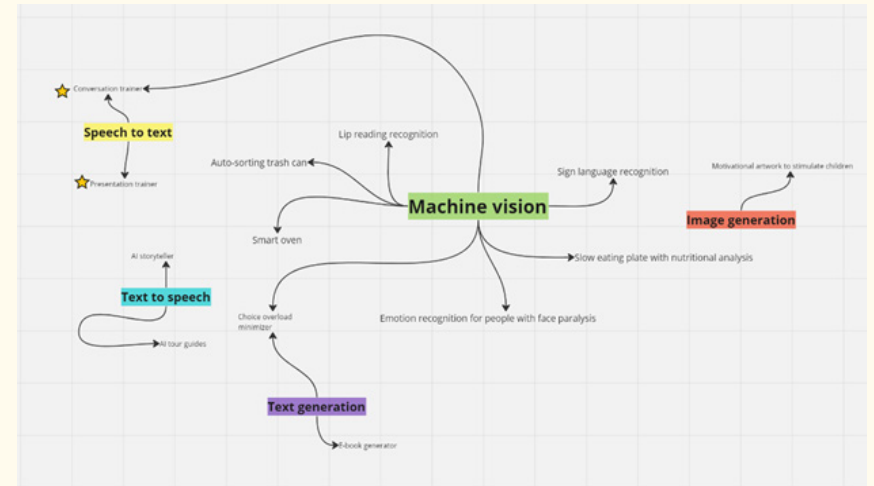


Figure 6: Exploration of different AI models

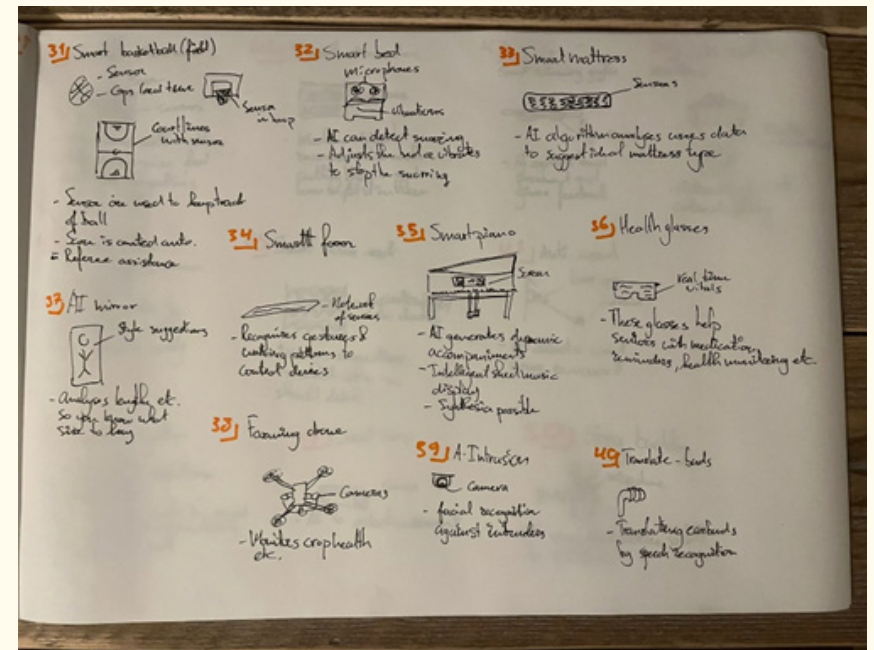


Figure 7: Sketches of possible designs with AI



Lack of emotional expression is harmful for one's mental well-being. Through the literature given in the introduction section and the research by Patel et al. [29] it was concluded that expressing emotions is crucial for maintaining well-being. Talking to families, friends or counselors are the best ways of opening up but not the only ones. Writing, recording a tape are also options[29] These findings pushed us to explore promoting emotional expression.

There are many designs and works that focus on helping children and children with autism identify their emotions such as products like Moxie an AI-powered robot game like Emoplay, feeling charts, and emotion balls. However, there is less focus on helping the young with emotional expression. College transition can be challenging for young adults, who must navigate stressful academic and social demands with less reliance on family[30]. Young adulthood, age between 18-26 is a transitional period during life when young people are expected to become financially independent, establish romantic relationships, and be productive members of the community [31]. Park et al. [32] state that students encounter challenging contexts during the first year, and they may be uncertain about how to express their emotions, resulting in greater use of suppression strategies.

The findings showed the need for accessible tools that facilitate emotional expression among young adults. The target group has chosen to be young adults specifically aged between 18-26 who face challenges in expressing their emotions.

Accessible ways for expressing and reflecting on emotions were explored such as journaling applications, and expressive writing which can be seen in related works. Additionally, the topic of art in emotional expression was encountered. Research and studies that have been done on the topic of 'Art and well-being' are presented in Related works. These studies mention the possible benefits of art in relaxation and emotional expression. The findings revealed an effective way of expressing emotions, which is drawing. Yan et al. state that brain activity changes while drawing revealing that drawing is effective in regulating negative emotions, especially sadness [33]. When people express their positive or neutral emotions by drawing, emotional arousal decreased [34]. Drawing is a tool applicable across various platforms, ranging from paper to virtual reality. The introduction of AI brings opportunities for exploration and innovation in this



Exploration phase 1

Shortly after exploring image generators like Deep Dream, Stable Diffusion, and Midjourney, the option of 'adding a base image' was discovered. This feature works by providing the platform with both a text prompt and an image for it to combine into one image. This feature led us to think of a collaborative art-making process between AI and the user. Where users would draw and talk to AI about their current emotions and have these combined in an image.

It was thought that with an enhanced artwork users might feel more confident with the outcome. This assumption was decided to be explored during mid-term demo day and further research. Artbreeder was chosen to be used on midterm demo day. The reason is its accuracy in combining the two inputs as can be seen in figures 8,9. Research shows that AI generators could create images that align with human emotions [35]. However, this research didn't test if there would be a difference in results when the users' inputs were included in the drawing therefore outcomes could be different for Mindsketch

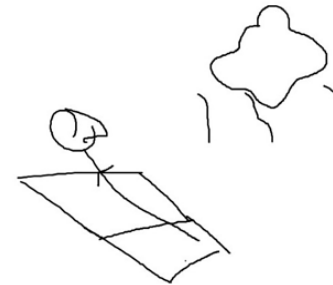


Figure 8: Sketch before Artbreeder



Figure 9: Sketch after Artbreeder

During the exploration phase of using drawing to express emotions, the potential need for guidance among the target group was recognized. This was validated through our user survey which will be further explained.

The popular AI model ChatGPT was found to be knowledgeable enough to give guidance on how to draw emotions. However, speech was decided to be used as user input rather than text to prevent users from being disturbed by constant typing. It was realized that there is a need for text input for Artbreeder to combine with drawings. It was decided that users' conversations with AI could be translated into this text input. The feasibility of this concept is a possible problem that needs to be mentioned. Translating the voice input into a meaningful text prompt for an image generator to comprehend would require high-level programming knowledge. Since it was the early stages of the design process, it was decided that the feasibility part should be discussed and further explored later.

Iteration 1

As midterm demo day was approaching and the features of Mindsketch were still to be tested, designing a low-fi prototype started. Sketching sessions were done in order to come up with different shapes, and designs for the product as can be seen in figure 10 and 11.

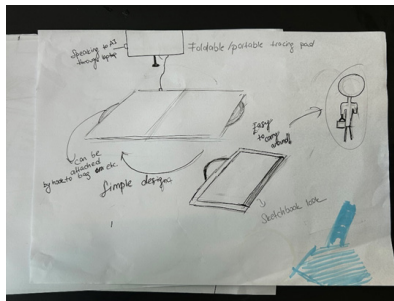


Figure 10: Sketch of foldable track pad

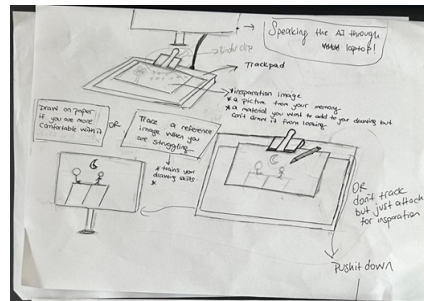


Figure 11: Sketch of a trackpad with paper holder

It was not decided in which settings Mindsketch would be used yet. Since the goal is to give users a space to express their emotions, making a portable device was considered to be a good option. It seemed ideal to have two screens as it might be hard to fit a drawing interface, the prompts and rendered images in only one screen. The sketches that met these criteria and had a user-friendly interface were chosen. Which was a design inspired by the Nintendo DS. The design was 3D-modelled using Fusion 360 which can be seen in figures 12,13. It was decided to have two prototypes for midterm demo day, one that represented how we aimed our design to look and one that created the 'experience'. The first prototype was made with Adobe Illustrator and laser cutting as seen in figure 14.



Figure 12: 3D model of first design



Figure 13: 3D model of first design on a table



Figure 14: Physical prototype of first design

For the experience, a tv screen was used with a touch glass where users could draw on and see the outcome at the same time as seen in figure 15. This was done to give users more space to experience the concept. A laptop was used for the chatbot and drawing enhancing part.

To mimic the responses of a chatbot, ChatGPT was asked to provide guidance on drawing emotions. These responses were gathered to create an interactive screen using processing as seen in figures 16,17. The screen was created where 10 emotions were written and when they were tapped on, would provide guidance on how that emotion could be drawn. (see appendix B for prompts) In midterm demo day the user input was manually typed into Artbreeder. After the users are done with their drawing, a screenshot of their work will be taken and uploaded to Artbreeder to present the enhanced image. Some of the drawings can be seen in figures 18, 19, 20.



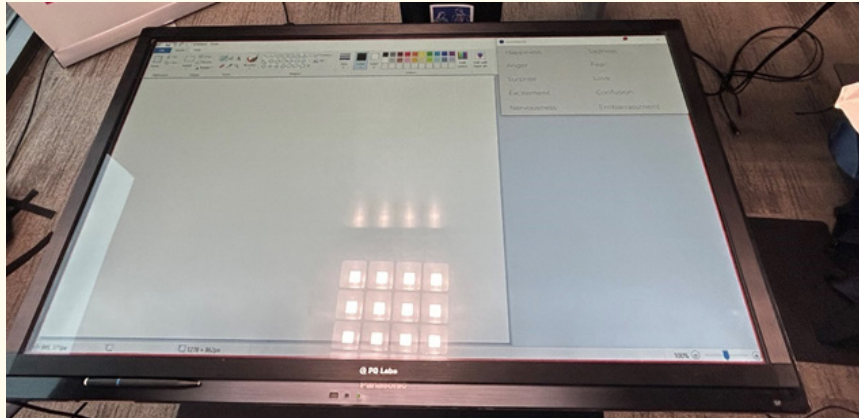


Figure 15: Midterm demo day interactive screen setup

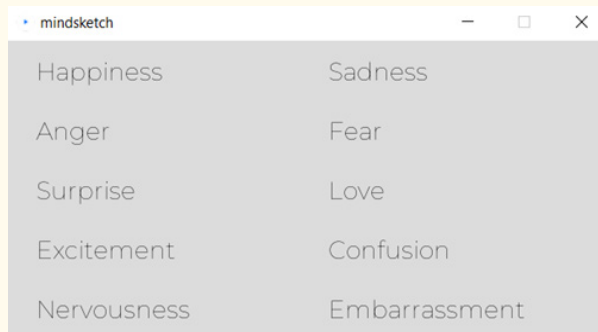


Figure 16: Prompt selection screen

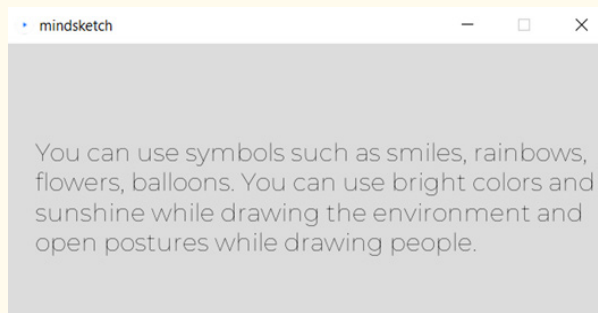


Figure 17: Example prompt of happiness



Figure 18: Drawing midterm 1

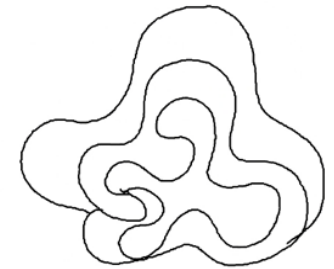


Figure 19: Drawing midterm 2

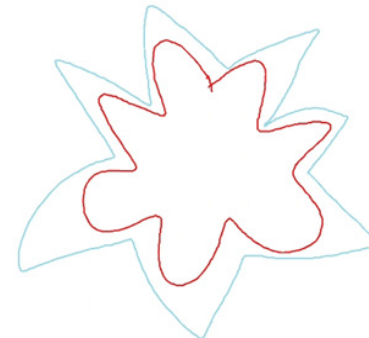


Figure 20: Drawing midterm 3

Bridge phase 1

After the midterm demo day, the feedback was separated into sections to discuss in the meetings which can be seen in Table 1

The feedback received in terms of the design concept led to outcomes that we were insufficient in explaining the design concept in a clear way and that there was a lack of mention of user needs. The use case of the design should be identified in a more clear way.

Feedback received on the design features concluded that there was no sufficient answer to why our device wasn't an app but instead a portable design. Possible changes in the shape and features of the design were decided to be discussed. Discussions also showed the unlikely scenario that people would talk about their emotions to a device in public places. This showed that the main focus should not be on how to make Mindsketch portable.

Some visitors had a hard time knowing what to draw. They mostly did not talk about their emotions but sketched random objects and explained what those were. Looking at feedback on prompts Some, only used the guidance prompts for their drawings whereas some found the prompts too specific and restrictive. The note was taken to talk to an art therapist and another expert for more guidance about this topic.

It was realized that a user study has to be done to clear some of these lacking areas.

Design concept	Design features	Prompts	Future steps
- Move into a specific direction, maybe this device can help users improve their drawing skills - Maybe make it a tool for families to share, like a painting on the wall	- Maybe the ability to change your drawing after you're done - AI can also add to the drawing while user is drawing	Prompts are too specific and not personal	Test this product
- Look at different application areas, think of other various concepts. - Come up with one focus, decide on one a specific case where this device will be used	- The product can be a phone accessory - Track pad on the case of a tablet - painting on the wall	Prompts are difficult to follow	Talk the owners of related research
Design for the target group, consider their needs	Portability isn't a must, the device is still big to be portable, doesn't fit in a pocket	Consider removing the prompts and only have speech recognition	Think about the privacy concerns
- What to draw is not clear enough - Think if people draw when they want or does the device trigger them to do	Why not an app?		Talk to art therapists
Outcomes: - Design goal was not explained properly - Focus and use case of the product needs to be clearly identified - User needs should be explored	Outcomes: - The shape of the design requires iterations. - Better reasonings of making a physical designs - Doesn't have to be a portable design, explore different shapes - Consider adding different features	Outcomes: - Iterate on prompts - Prompts can be restrictive and can create confusion - Reconsider this feature	Outcomes: - User test must be done soon - Experts should be contacted - Similar works should be explored

Table 1: Midterm demo day feedback overview



After the midterm feedback, shape explorations were done. Different designs were explored such as the concept of having a shared painting on wall. This idea was found interesting however raised some doubts since there was a chance that people might feel overwhelmed when they needed to share their drawings.

The idea of having a trackpad on back of the phone and as an accessory on a phone was discussed. However, both of these options could be replaced by phone screen. Different ways of providing a better drawing process were thought about however it was realized that we were focused heavily on finding a design that could potentially replace the need for an app. This restricted us from truly strengthening the concept. It was thought that gaining more insight on the user group before focusing on the shape explorations would be a better approach.

Methods

A user survey was prepared in order to gain more insights into the target groups' preferences and their thoughts on the concept of drawing to express emotions. The survey was shared with a diverse group of people via WhatsApp. It was filled by 18 participants all young adults aged between 19-22 who were from 7 different majors including 3 graduates. The survey started with a brief explanation of Minds sketch. The survey included open-ended and close-ended questions as well as rating scale questions. The survey included questions to assess whether users would use Minds sketch, why, and why not. The survey was prepared in a way that it was open for user feedback.

Results and discussion

Results show that (see Appendix D) 78% participants struggled with expressing themselves, which validated the research findings about challenges of young adults in expressing their emotions as seen in figure 21. Seen in figure 22, half of the participants didn't believe it would be useful to draw about these emotions. Those who didn't believe gave reasons such as not being good or confident in drawing. Some preferred talking. This validated the statement that individuals unfamiliar with drawing may need guidance to draw their emotions. On the other hand, half of participants believed drawing could help them express their emotions. The differences may have arisen because of user backgrounds, familiarity with drawing, and their willingness to express and reflect on emotions.

As seen in figure 23 there is a great amount of participants that wouldn't be likely to use the product. On the other hand, 66.7% of participants found value in our tool as seen in figure 24. These outcomes created an inconsistency, indicated that people might not be likely to use the device even if they find value in it. It can be argued, that users who don't prefer drawing might still find value in it but wouldn't use the product.

This user study raised the question if drawing was actually a good way for people to reflect on and express their emotions. And made us question if we really knew what our user's needs. These results made us question if users really did understand the concept or if there were any biases effecting their answers. It was wanted to make a product that users would find value in it as

Do you sometimes struggle expressing yourself?
18 yant

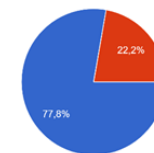


Figure 21: User survey 1 question 1 responses

Do you think drawing those emotions will help you express yourself?
18 yant

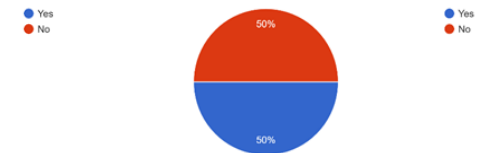


Figure 22: User survey 1 question 2 responses



How likely are you to use a digital platform that uses AI to assist in expressing and reflecting on your emotions through art?

18 yant

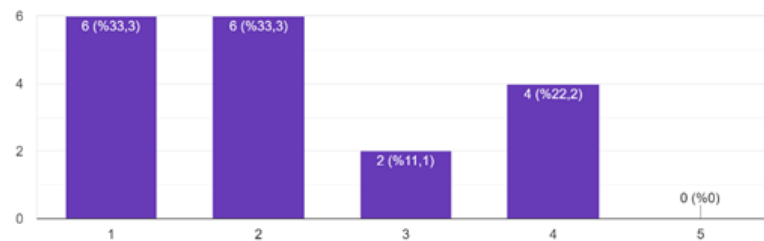


Figure 23: User survey 1 question 3 responses

Would you find value in a tool that guides you in self-reflection through creative activities like drawing?

18 yant

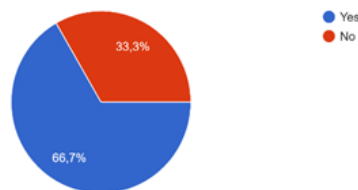


Figure 24: User survey 1 question 4 responses

Iteration 2

It was realized through the survey findings and coach feedback that we focused too much on how to use sketching feature without designing an app which kept us back from exploring new possibilities. Consequently, we decided to find new ways of emotional expression and dropped the sketching aspect.

Our challenge shifted to creating concepts without sketching but involving AI-based conversation. We wanted to design in a way that helped people open up and research supported that this could be done by physicalizing data. It was found beneficial for engagement in a design [36], leading to ideas like a box filling with balls seen in figure 25 or a digital screen displaying a filling bar to represent bottled-up emotions can be seen in figure 26. Additionally, in order to give users inspiration on what to talk about, a way of recording emotions throughout the day was thought of. Journaling apps mentioned in related work also use the method of mood tracking. Methods like an app or a device with buttons were thought of. The concept evolved to include a box filling with balls for bottled up emotions, together with an AI users could talk to. Recorded speech was used by a speech recognition AI to generate images, acting as a digital journal displayed on a screen.

This concept was pitched during design symposium. Feedback revealed that the concept felt too disconnected in relation to the first iteration on midterm demo day, unclear how we got there. User studies decided to be done for more user insight. Further consultations with coaches, experts like Joep Frens and art therapist Micheal Smit led to reevaluation of the concept.



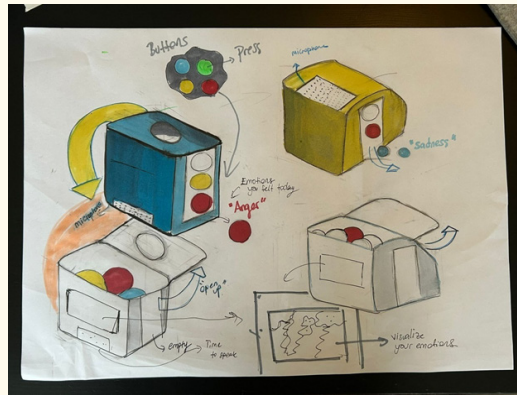


Figure 25: Sketches of second iteration

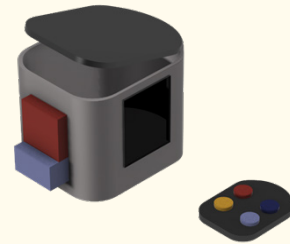


Figure 26: 3D model of second iteration

Methods

To validate and test the decisions, two design research techniques were used. Which were user surveys and expert interviews one with an art therapist and one with a designer. The art therapist contacted was Michael Smit. He is a relational artist, relational practices innovator, and expert as an art therapist. To get valuable feedback from the art therapist the current concept of using AI art creation for emotional expression was pitched alongside with the first iteration to hear his thoughts. The interview wasn't structured but questions were to make sure valuable feedback was received.

A user survey was sent to young adults from different majors and graduates. The survey had twelve respondents, aged between 19 and 22. The survey content and answers can be found in the appendix C. The survey started with a quick explanation of the concept. Questions about the concept and users' preferences were asked in order to help guide us for future design decisions. Another expert contacted was Joep Frens, a researcher and designer. The goal of this meeting was to get his opinion on our second iteration and on parts where we were stuck.

Results and discussion

The user survey conducted as seen in Figure 27 showed that a little more than 91% of participants thought that the design would be useful for self-reflection and emotional expression. As seen in Figure 28, 75% of participants would use a device that generates drawings of their emotions when talking to it. As shown in Figure 29, 75% of participants preferred a digital screen over the ball-filled box due to its convenience and compactness.

The interview with the art therapist, Michael Smit showed that it is important to let users do a creative activity themselves, he explained that it is an essential part of emotional expression. He highlighted the importance of letting users be a part of the creative process and suggested improvements like allowing users to personalize AI-generated images or add their own part to it somehow. He stated solely having AI-generated images wouldn't be as helpful.

Meeting with Joep Frens showed that our second iteration didn't have the expression aspect anymore which was a strong side of our concept. He pointed out the limitations of the survey that led to the decision to drop sketching, emphasizing that drawing has inherent benefits in self-expression. The results of the two expert interviews resulted in realization that dropping the drawing aspect may not be the best decision. We decided to take a step back and try to solve the problems occurred in the first iteration rather than dropping sketching.



Do you think this device would be useful for your self reflection/emotional expression
12 yant

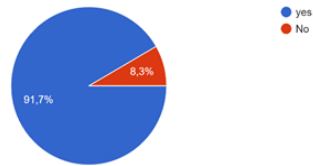


Figure 27: User survey 2 question 1 responses

Would you use an AI powered device that you talk about your emotions to that creates drawings of your emotional explanations
12 yant

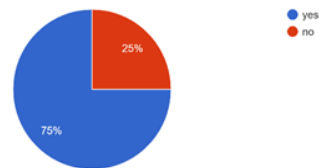


Figure 28: User survey 2 question 2 responses

Would you prefer to use Design 1 or design 2 (explanation at the top)
12 yant

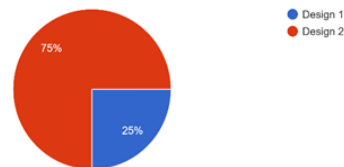


Figure 29: user survey 2 question 3 responses

Consequently, the next iteration focused on a larger-scale prototype enabling drawing as a primary form of expression, this was a design choice as from user testing it was learned that users preferred a larger canvas to express their emotion (see appendix F). The AI served as an inspirational tool rather than solely generating images, in order to allow users to add their own creativity. Insights from existing works referenced in related works, like IdeaWall, were considered, seeing that images created from verbal conversation can help with ideation and creativity, the decision was made to use AI generated images to support the guidance of users.



Final iteration

The final iteration is a frame for an interactive touchscreen as can be seen in figure 30,31. The size was 100x65 cm orientated vertically. The reasons being that it symbolized a painting since the idea behind it was that the user could create their own drawings/artworks while at the same time being a comfortable size for users to engage with and having its physicality remind the user of its presence and thus the function namely to express their emotions. It incorporates a one way verbal communication with AI and drawing phase as research and user studies showed that having the user reflect on their emotions through a form of expression, such as drawing, is essential. The interactive prototype is a tool where users can reflect on their day or week to express their emotions. Students experience a lot of stress and anxiety due to increased responsibilities, a lack of good time management, changes in eating and sleeping habits, not taking enough breaks for self-care or a shift in dynamics by going to college [37].

Underlying design principles

Accessibility: The frame on the wall allows for the user to reflect on their day whenever they get home.

Privacy: The frame is in the shape of a painting so can easily be hung in a bedroom or study room for privacy.

Time-efficient: Unlike therapy you would not need to visit anyone or go somewhere to reflect since it is in your room directly when you get home.

Comfortability: The large screen allows for users to easily draw, whilst not having to struggle with not enough drawing space. Additionally, we created a feature where users could verbally communicate with the AI instead of typing to save effort.

Customizable: The different colors and shapes available for the users in the drawing program allow for complete creativity. Whether they want to make realistic drawings or abstract artworks anything is possible.

Sustainable: The device is electronic thus not wasting costly raw materials and can be turned off when not being used to save electricity.

Aesthetics: The frame symbolizes a painting, and the software allows users to showcase their drawings, giving it an aesthetic purpose.

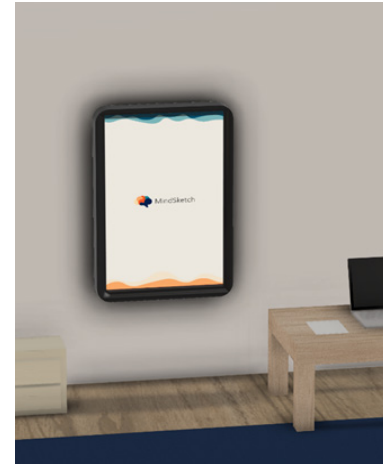


Figure 30: 3D render of final iteration



Figure 31: Mindsketch

The program is made in processing, in co-creation with ChatGPT which was used to check and improve the code. The code is then projected on our laptop screen, which is then display the laptop screen on a TV which enlarges the frame, making it easier for users to interact with it and signifying that the idea behind it is a painting which users create themselves. The image generation is done through an external website, namely 'Stable Diffusion' [40]. To allow the users to verbally communicate with the AI we implemented the voice dictation software which is automatically installed on every windows laptop.

A challenge we had to overcome was integrating the AI image generation into the prototype. None of us had much experience with coding, so with the time left it was not an option to integrate the actual website into our code since according to our coach that required more experience. So, it was decided that it would be integrated by using the wizard-of-oz technique. The way we eventually programmed this was by having a waiting screen in the processing code. This would give us 30 seconds to generate the images and download them. The images would be directly downloaded into a specific folder. And once the waiting time was up, the processing code would extract any image in that specific folder and upload them into the code, onto the screen for the user to see shortly.

Methods

For the user test, the focus was put on testing the concept rather than the product. Our first test was done by asking close and open-ended questions to see get user’s insights on provided images and their experience with drawing. Users were guided through sketching their emotions following up with questions. Five young adults were interviewed, ages 19-22 two mechanical engineering student, one architecture student one recent graduate, and one industrial engineering student. To verify whether AI generated images inspired the user rather than limiting their creativity. An additional study was done analyzing what the ideal time and image amount was for the user to be inspired, we did this through testing all different options and generated images based on user input.

Results and discussions

Results (see appendix A) showed that when users were directly asked to sketch their emotions without any guidance they found it vague and were unsure of the task at hand, validating that users needed some guidance. After looking at AI generated images 4 out of 5 users mentioned that the guidance gave them inspiration and helped them get started with their drawing . It was seen that even when images didn’t completely match users still found the experience valuable. Additionally, when users described their drawing most reflected on the drawings giving details about the meaning behind it. When starting the drawing most people took a part of the AI generated as a starting point. However, once they had continued drawing they added their own ideas to it. 2 of the users preferred drawing with shapes, colors where 1 person didn’t state a preference and 2 others preferred the realistic style. It was seen that they preference effected how useful they found the drawing experience. All participants stated that they would like to have this concept as a weekly habit and 3 out of 4 participants said that they would keep the drawings private. The interviews showed that providing users with AI generated images helped them with drawing and the overall drawing experience helped them reflect on their emotions and was found useful. Some of the drawings made by participants can be seen in figures 32, 33.



	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Effectiveness of inspirational images: Found it usefull: Green Not sure: Blank					
Preference between drawing styles Drawing with shapes/lines: Blue Realistic style: Yellow No preference: Blank					
Overall experience with drawing	It was fun because usually I don't really think about my feelings. I don't really think of how I feel at certain situations and not really reflect on my feelings, but I think it's more important to do so	If I hadn't drawn this, then I wouldn't be able to reflect on what I experienced during this day. After this task, I was able to remember and then explain them through a drawing which helped me release these emotions.	I really liked it and I also like the AI inspiration because at first, I haven't got any ideas about how I'm going to sketch my feelings, but after you show some images. I got some inspiration and I draw them	It felt good because it was relaxing to draw my feelings. Like what is it inside my head. Like, I feel relaxed right now	'I liked it. It made me think about why I was feeling like this and then finding ways to represent it in a nice way.'
Making it a weekly habit Green: I would make it a habit					

Table 2: Visualization of user interview results

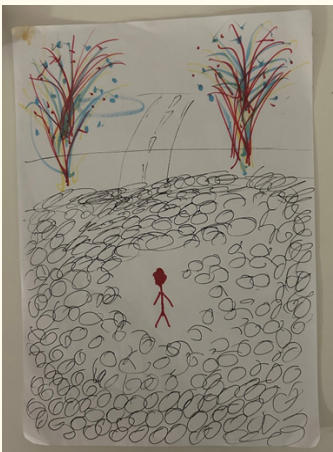


Figure 32: Sketch by participant 1

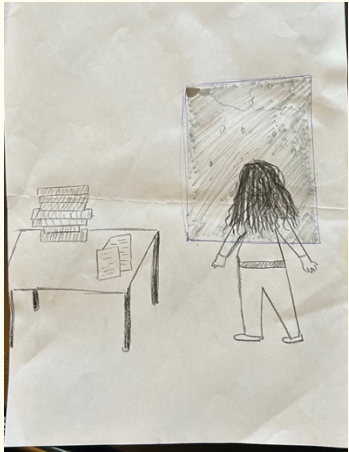


Figure 33: Sketch by participant 3

Overall results

Our concept has proven to be successful as users claimed that drawing made them feel relieved from their emotions. AI image generation helped most people be inspired while some still found it a blockade to their own imagination. Something we discovered is that sometimes images did not match the users vision due to a non-properly structured prompt, but in the end it did not affect their drawing capabilities negatively. The combination of journaling and drawing helped them reflect back on emotions. Some advice received on the final demo day, was that the product was still lacking in the usability of the AI generated images as they mentioned that it might be a next step for the users to allow the AI to contribute to their artwork or complete the artwork generated by AI.

Limitations

The main limitation we have in our design is thinking about the consumer. Originally our concept was meant to be used and sold to our target audience, 18 to 26-year-old students. However, in reality that would not be as successful since the price of such a device would come near 2000 euros as a product, which is too much money for students for a one-purpose device. Thinking about this we realized that even though our target audience should remain the same we could think about a different marketing strategy. Namely that the product would be sold to universities/schools. This is because at universities there are so many students who struggle with expressing their emotions and require a break to reflect on their mental state throughout the day. Having the option to buy a select amount of these devices would be a great investment as they could be used by multiple students, while still keeping the privacy principle by creating a personal space room on campus. In relation to buying these for personal use it would be a much more economically beneficial option while promoting the mental wellbeing of students. Finally, the concept would have to change a bit since the device itself would no longer have a journal mode since those are private drawings. But instead, it would have the option of sending the finished drawing to your mail privately or have the option to share it with other students in a collaborative environment where others can see what drawings were made.



Envisioning the future

Feedback from demo day (see appendix G) gave us insights on aspects of the final iteration that would be changed to make the product even more optimal for a better user experience, if we had more time and experience. Firstly, we would need to change the setting of the product as explained in limitations. Secondly, there should be more research and user testing done on finding the ideal time and number of showing the AI generated images that users require to be inspired. As with the limited time and users available it was a challenge to conduct tests on enough people. Finally, our prototype now is in the form of a reflecting tool, where users can draw their emotions and share them with others if they would want. To take it to the next step we would have to integrate an emotion detecting AI chatbot that would converse with the user depending on what they draw. This is a dangerous line because it is a very sensitive topic and shouldn't be perceived as a replacement for therapists, therapy is a concept too difficult for the AI to do. However, developing the AI to those capabilities is worth it, since users would be able to save money on but still reflect whenever they feel like it. Additionally, it can be used any time of the day.

Conclusion

Mindsketch gives the user an interactive approach to expressing their emotions on a canvas through drawing. The prototype consists of a screen that users have in their room, on the wall to be reminded weekly- to take some time to reflect on their emotions and work on their mental well-being. They are guided by an AI image generator tool to gain some inspiration on what to draw. They are then given the time and space to draw however and whatever they feel. These drawings, if authorized, get saved on the device and played back as a form of journal to later reflect again on these drawings. It was seen that showing multiple AI images for only a short period of time gives people a feeling of what they can aim their drawings towards if they have no inspiration. Finding the optimal balance between showing only a few images for a long amount of time and too many images for a short time. Because in a non-perfect scenario the user would either copy the image entirely or do not have enough time to be inspired by the images. It was attempted to test and find the optimal setup so that a person is inspired but still adds their own creativity to the drawing, but this was harder to test than thought so for the future it would need to be tested with more participants and more scenarios.

Overall, to answer the research question on; what influence AI-guided drawing has on the emotional expression of young adults. From testing we found that users find it relieving to put their emotions on a canvas. In addition, having AI generated images helps them find a spark to start their drawing. Furthermore, user tests revealed that people express different thoughts through drawing that they would not have mentioned in a conversation. Throughout our design process we discovered that when drawing people find it easier to up and express their emotions through sketches.



Task division

Elif Özyaşar:

- Worked in ideation processes of all iterations
- Made sketches for all iterations
- Made research on benchmark and AI and art therapy
- Made 3D models of all iterations
- Made the 3D model for both the midterm and final demo day poster
- Made the prompt screen for midterm demo day
- Edited the midterm video
- Worked in related works section in the midterm report
- Conducted the interview for the final iteration
- Contacted and interviewed both art therapists
- Written the related work section and the design process till iteration 2
- Worked on the user interview questions
- Worked on the pitch of final demo day
- Worked on brand identity by creating illustrations
- Created dynamic illustrations for the system using processing

Daniël de Goederen:

- Worked in ideation processes of all iterations
- Made sketches for all iterations
- Did research on benchmark AI and art therapy
- Made brand identity behind Mindsketch
- Made posters excluding visual for midterm and final demo day
- Conducted interviews for final iteration
- Made surveys for user testing
- Interviewed art therapists
- Report work:
 - o Introduction
 - o Second iteration
 - o Layout and design for the entire report in InDesign
- Introduction, conclusion and future work for midterm report
- Built the frame for the final demonstrator

Reijer Koudenburg:

- Coding for the final program
- Made sketches for all iterations
- Built the wooden frame to hold the screens
- Conducted user studies
- Conducted the interview for the final iteration
- Created user questionnaire
- Filmed and edited final video
- Interviewed Art therapist
- Research on benefits of data physicalizing
- Report work:
 - o Final iteration
 - o Limitations
 - o Conclusion
 - o Envisioning the future
 - o Appendix
 - o Abstract
- Design process for midterm report

Use of AI

AI was used in this project to improve coding, used as a grammar check on writing and improve sentence structure.



References

- [1] Mental Health. (2023). Retrieved from <https://www.cdc.gov/healthyouth/mental-health/index.html>
- [2] Mekouar, D. (2022). Why people worldwide are unhappier, more stressed than ever. Voice of America. Retrieved from <https://www.voanews.com/a/why-people-worldwide-areunhappier-more-stressed-than-ever-/6658784.html>
- [3] Gould, W. R. (2021). The Dangers of Bottling Up Our Emotions. Verywell Mind. Retrieved from <https://www.verywellmind.com/the-dangers-of-bottling-up-our-emotions5207825#:~:text=Ultimately%2C%20though%2C%20we%20tend%20to,emotional%20measures%2CE2%80%9D%20says%20Dr>
- [4] Centers for Disease Control and Prevention. (2021). Youth Risk Behavior Surveillance Data Summary & Trends Report: 2011-202. Retrieved from <https://www.cdc.gov/healthyouth/mental-health/index.html>
- [5] Ky Counseling Center. (2022). Why Is Bottling Up Your Emotions Bad for You? Kentucky Counseling Center. Retrieved from <https://kentuckycounselingcenter.com/how-bottling-up-your-emotions-is-bad-for-you/#:~:text=Your%20physical%20and%20mental%20health,of%20developing%20a%20chronic%20illness>
- [6] Gómez-Restrepo C, Casasbuenas NG, Ortiz-Hernández N, Bird VJ, Acosta MPJ, Restrepo JMU, Sarmiento BAM, Steffen M, Priebe S. (2022 Dec). Role of the arts in the life and mental health of young people that participate in artistic organizations in Colombia: a qualitative study. BMC Psychiatry. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9719131/>
- [7] Ford et al., (2018). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. Journal of Personality and Social Psychology. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5767148/>
- [8] WoebotHealth 2023. Retrieved December 15, 2023 from <https://woebothealth.com/>

[8] WoebotHealth 2023. Retrieved December 15, 2023 from <https://woebothealth.com/>

[9] Johan Oswin De Nieva, Jose Andres Joaquin, Chaste Bernard Tan, Ruzel Khyvin Marc Te, Ethel Ong. 2021. Investigating Students' Use of a Mental Health Chatbot to Alleviate Academic Stress. In 6th International ACM In-Cooperation HCI and UX Conference (CHIuXiD '20). Association for Computing Machinery, New York, NY, USA, 1–10. <https://doi.org/10.1145/3431656.3431657>

[10] Headspace 2023. Headspace:Meditation and sleep made simple. Retrieved from December 15, 2023 from <https://www.headspace.com/>

[11] Sarah Bradeley. 2023. I Tried the Woebot AI Therapy App to See if It Would Help My Anxiety and OCD, Verywell Mind. (August 2023) Retrieved December 15 2023 from <https://www.verywellmind.com/i-tried-woebot-ai-therapy-app-review-7569025>.

[12] Taskade Blog 2023. 7 Best Ai Apps For Journaling. Retrieved from <https://www.taskade.com/blog/best-ai-apps-for-journaling/#:~:text=Reflectly%20is%20an%20AI%20app,of%20mood%20tracking%20and%20journaling>

[13] Brett Q. Ford, Phoebe Lam, Oliver P. John, Iris B. Mauss. 2018. The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *Journal of Personality and Social Psychology* 115, 6 (December 2018), 1075–1092. [DOI:http://dx.doi.org/10.1037/pspp0000157](https://doi.org/10.1037/pspp0000157)

[14] Karen A. Baikie and Kay Wilhelm. 2005. Emotional and physical health benefits of expressive writing. *Advances in Psychiatric Treatment* 11, 5 (2005), 338–346. [DOI:http://dx.doi.org/10.1192/apt.11.5.338](https://doi.org/10.1192/apt.11.5.338)

[15] Jeremy Sutton. 2023. 5 benefits of journaling for mental health. (October 2023). Retrieved December 15, 2023 from <https://positivepsychology.com/benefits-of-journaling/>

[16] Brenda Hayman, Lesley Wilkes, and Debra Jackson. 2012. Journaling: Identification of challenges and reflection on strategies. *Nurse Researcher* 19, 3 (2012), 27–31. [DOI:http://dx.doi.org/10.7748/nr2012.04.19.3.27.c9056](https://doi.org/10.7748/nr2012.04.19.3.27.c9056)

[17] Kendra Cherry. 2023. What Is Art Therapy? (November 2023). Retrieved December 1, 2023 from <https://www.verywellmind.com/what-is-art-therapy-2795755#citation-24>

[18] Apoorva Shukla, Sonali G. Choudhari, Abhay M. Gaidhane, and Zahiruddin Quazi Syed. 2022. Role of art therapy in the promotion of Mental Health: A Critical Review. *Cureus* 14, 8 (August 2022) [http://dx.doi.org/10.7759/cureus.28026](https://dx.doi.org/10.7759/cureus.28026)

[19] Sarah Kuta. 2022. How Making Art Helps Improve Mental Health (July 2022) Retrieved from <https://www.smithsonianmag.com/science-nature/can-art-therapy-help-patients-deal-with-mental-health-struggles-during-the-pandemic-180980310/>

[20] Fiona Yassin. 2021. The art of healing – using art as therapy with teenagers and young adults. (January 2021). Retrieved December 3, 2023 from <https://thewaveclinic.com/blog/art-as-therapy-with-teenagers-and-young-adults/>

[21] Annemarie Madani-Abbing. 2020a. Art therapy & anxiety. dissertation. Leiden, South Holland: Leiden University Scholarly Publications.

[22] Yu Zhan Yu, Cong Yu Ming, Ma Yue, Jiang Hai Li, and Li Ling. 2016. House–tree–person drawing therapy as an intervention for prisoners' pre-release anxiety. *Social Behavior and Personality: an international journal* 44, 6 (July 2016), 987–1004. [http://dx.doi.org/10.2224/sbp.2016.44.6.987](https://doi.org/10.2224/sbp.2016.44.6.987)

[23] Henry Roberts. 2023. Art therapy: Unveiling its disadvantages. (October 2023). Retrieved December 1, 2023 from <https://oatuu.org/art-therapy-unveiling-its-disadvantages/>

[24] Daeun Yoo. 2022. Retrieved December 15, 2023 from <https://www.daeunyoo.com/>



[25] Xiangyun Du, Tatiana Chemi, Chiaki Ishiguro, and Takeshi Okada. 2017. In Arts-based methods in education around the world. Gistrup, Denmark, North Jutland Region: River Publishers, 205–228.

[26]]Yang Shi, Yang Wang, Ye Qi, John Chen, Xiaoyao Xu, and Kwan-Liu Ma. 2017. IdeaWall: Improving Creative Collaboration through Combinatorial Visual Stimuli. In Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17). Association for Computing Machinery, New York, NY, USA, 594–603. <https://doi.org/10.1145/2998181.2998208>

[27] Hao-Chuan Wang, Dan Cosley, and Susan R. Fussell. 2010. Idea expander: supporting group brainstorming with conversationally triggered visual thinking stimuli. In Proceedings of the 2010 ACM conference on Computer supported cooperative work (CSCW '10). Association for Computing Machinery, New York, NY, USA, 103–106. <https://doi.org/10.1145/1718918.1718938>

[28] Ford, R. (2022). Design is not a formula, it's an odyssey: replacing the Double Diamond. Retrieved from <https://uxdesign.cc/design-is-not-a-process-its-an-odyssey-replacing-double-diamond-d6bco6965238>

[29]] Jainish Patel and Pritesh Patel. 2019. Consequences of repression of emotion: Physical Health, Mental Health and general well-being. International Journal of Psychotherapy Practice and Research 1, 3 (February 2019), 16–21. DOI: <http://dx.doi.org/10.14302/issn.2574-612x.ijpr-18-2564>

[30] Mofatteh M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. AIMS public health, 8(1), 36–65. <https://doi.org/10.3934/publichealth.2021004>

[31] Committee on Improving the Health, Safety, and Well-Being of Young Adults; Board on Children, Youth, and Families; Institute of Medicine; National Research Council; Bonnie RJ, Stroud C, Breiner H, editors. Investing in the Health and Well-Being of Young Adults. Washington (DC): National Academies Press (US); 2015 Jan 27. 1, Introduction. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK284791/>

[32] Crystal L. Park et al. 2021. Development of emotion regulation across the first two years of college. Journal of Adolescence 84, 1 (October 2021), 230–242. DOI:<http://dx.doi.org/10.1016/j.adolescence.2020.09.009>

[33] Wenhua Yan, Meng Zhang, and Yuting Liu. 2021. Regulatory effect of drawing on negative emotion: A functional near-infrared spectroscopy study. The Arts in Psychotherapy 74, 5 (February 2021). DOI:<http://dx.doi.org/10.1016/j.aip.2021.101780>

[34] Kristen Diliberto-Macaluso and Briana Lyn Stubblefield. 2015. The use of painting for short-term mood and arousal improvement. Psychology of Aesthetics, Creativity, and the Arts 9, 3 (May 2015), 228–234. DOI:<http://dx.doi.org/10.1037/a0039237>

[35] Theresa Rahel Demmer, Corinna Kühnapfel, Joerg Fingerhut, and Matthew Pelowski. 2023. Does an emotional connection to art really require a human artist? emotion and intentionality responses to ai- versus human-created art and impact on aesthetic experience. Computers in Human Behavior 148 (July 2023). DOI:<http://dx.doi.org/10.1016/j.chb.2023.107875>

[36] Peeters, D. (2022). Physicalization of dynamic, physiological data. In University of Twente. University of Twente. Retrieved November 19, 2023, from https://essay.utwente.nl/91664/1/Peeters_BA_EEMCS.pdf

[37] UNC-Chapel Hill Learning Center. (2022, July 25). College Stress – Learning Center. Learning Center. <https://learningcenter.unc.edu/tips-and-tools/managing-college-stress/>

[38] Mofatteh, M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7870388/>

[39] Coffey, C. (2023). Stop Suppressing Emotions: A Better Way to Manage Unwanted Feelings. Retrieved from <https://www.watershedcounselingms.com/2023/06/stop-suppressing-emotions-a-better-way-to-manage/>

[40] Stable diffusion online - AI image Generator. (n.d.). <https://stablediffusionweb.com/>



Appendix

Appendix A

Interview 1 (image generation) responses

Participant 1

The aim of the interview and the goal of Mindsketch was explained.

What are some of your current daily habits and do you have physical reminders of these tasks?

1- I wake up, I make my bed. I have breakfast, brush my teeth and I remind myself many of those stuff, especially the small stuff such as like taking my vitamins with stacking the habits on top of each other. For example after I make my bed, I immediately know that I have to brush my teeth because I do that every day. That's also how I add new habits to my life, stacking helps.

Do you have any physical reminders of them?

For my habits, I don't really need to remember them, I just have them in my head. But if I'm trying out a new habit or have to remember something I have to do, I either put a reminder on my phone or write it in my hand.

If I were to ask you sketch your emotions, what would you draw? Would you be able to do it?

2- I don't know what I would draw probably some abstract shapes, I don't know.

For AI to generate an accurate image that represent your feelings, I want you to first think about your day and think about the feeling you recall the most that you would want to express. To give the AI a better prompt I want you to say it like 'Draw this' so the AI can understand it better

3- 'Draw some exciting and new event. It's exciting, but at the same time it's a bit unknown like fog, which also causes fear. It's a part of excitement but causes bit of a fear. This event is crowded but also I'm feeling kind of alone.

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel. You can use these images for inspiration.

Can you describe what you have drawn?

4- This is supposed to be representing me because it's my emotions and

and this is the crowd. It's and I'm on a road here. Road is filled with fun stuff because it's the journey of life. It's fun, it's exciting, but it's going along way and you can't really tell where it ends or where it leads. But again, as you see along the road, there are a lot of stuff that you have to take a look at and actually enjoy. But this is kind of like there's a space in between. I don't know. Sometimes, even though you're surrounded by a lot of people, or you may seem so popular, you may seem like you hang out with a lot of people. You might still feel alone, or I don't know, not connect with someone on the emotional level. And sometimes you feel that loneliness and sometimes you don't.

How would you describe your experience with this task?

5- I think it was fun because usually I don't really think about my feelings. I don't know why. It's a part of being a man I guess. I don't really think of how I feel at certain situations and not really reflect on my feelings, but I think it's more important to do so and that can be more improved by some mindfulness exercises like this. I always keep my mind occupied with stuff, even if I'm not working, I just check my phone, keep my mind occupied and not really give it some space to actually think about what I feel like or what I want.

Did the images you were shown help you with the drawing? Would it have been the same without?

6- I mean, it gave me some inspiration, but at the end when I looked at it and then what I had in mind, I just combined the two. So not really copy.

Did the images restrict you in any way or did it make the drawing process smoother?

7- I mean, it made the process definitely smoother because it's really hard to come up with a drawing out of nowhere, but that gives you some inspiration, but again, it didn't completely reflect what I had in mind, so I had to put my own stuff. So that was good.

What was the first thing that came to your mind when sketching? Did you first think about the memories or shapes you can draw?

8- I think I didn't think about neither. I just thought about how I feel about life overall.

How challenging was it for you to express your emotions through a sketch?

9- I mean, not that challenging. It's a 4 out of 10, but without the image, it may be 6 or 7.

Do you feel that your sketch accurately reflects your initial emotional state or did any changes occur when you started drawing?



Not really changed, no.

Did the AI generated images shown correctly depict what you were trying to convey?

10- Not fully because I talked about something exciting and fresh, and then the AI images gave me some English town with fog and grey sky.

Is there anything else you would like to share about your experience or any insights you gained from this activity?

11- I think it was a pretty good experience, getting in touch with your feelings and I think I have to do it more often.

Would you consider making this a weekly habit?

12- Yeah, I think it can be quite helpfull. It's some form of journaling practice and you think about how you feel, and then you write it down or you draw it like this. But in the end, a lot of people just neglect it and just skip it. But when you actually do it, I think it's a healthy practice for your mind.



Second experiment

It was found that some people prefer using things like shapes, lines color blocks to represent their emotions. I want you to think of how you are feeling and choose shapes lines colors or anything you want. You can give a prompt of the emotion you want to convey and explain with with what..

Prompt: draw my excitement, but a bit of stress using shapes, lines and colors

I draw circles and colors to show my excitement

Can you talk about this experience? Can you compare this to your previous experiences?

13- I think this was worse compared to the previous one. In terms of reaching my emotions, because when I think about emotions. I don't think about shapes or colors. I think about some situation even though I did not live through that situation. I can convey my emotions through my thoughts and what I think of right now. So I think using a bunch of lines and colors it's kind of hard to convey your emotions that way.

What were the differences?

14- I think it was harder.

How was it harder?

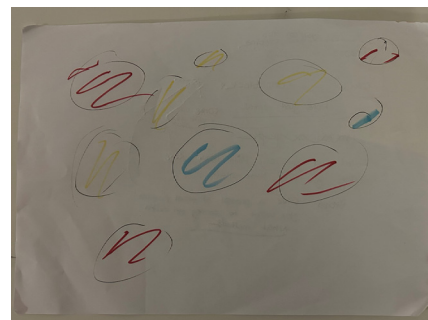
15- It was harder because i cannot what i feel emphasize with shapes and colors. But when I draw something or some people, I can actually convey my feelings .

Which one would you prefer?

16- I would prefer the first one. Also one more thing, the AI prompt images did not reflect what I felt at all. They were all a bunch of lines thrown together, making me feel anxious even.

How different would it be if I wasn't there and you only talked to the AI? After you are done with drawings would you prefer to share them or keep it to yourself?





Participant 2

What are some of your current daily habits and do you have physical reminders of these tasks?

1. I daily use multivitamins. Vitamins and also some other supplements. As reminders, I just put them into my living area and then I see them. I remember. And I have no other physical reminders. I use the reminders app on my iPhone. If I were to ask you sketch your emotions, what would you draw? Would you be able to do it?

2. There's no particular thing that comes to my mind apart from drawing myself sleeping in my bed but i don't think that would make any difference in my mood. For AI to generate an accurate image that represent your feelings, I want you to first think about your day and think about the feeling you recall the most that you would want to express. To give the AI a better prompt I want you to say it like 'Draw this' so the AI can understand it better

- Prompt: Today I had to go to my internship. However, I was unfortunately fell asleep. And I didn't want this to happen at all. This also happened to me a week ago, couple of times. So I'm pretty stressful and regretful about that. And I would like that to be fixed, draw this.

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel.

Can you explain the drawing

3. I have drawn myself in the bed while feeling sad. Because that was my feeling when I got up and looked at the clock. And the upper picture is my room and the below picture is my work environment. Where the staff is angry. Because I'm late. How would you describe your experience with this task?

4. If I hadn't drawn this, then I wouldn't be able to reflect on what I experienced during this day. Because probably if you have never asked, I wouldn't think about this ever again. After this task, I was able to remember and then explain them through a drawing which helped me release these emotions.

Did the images you were shown help you with the drawing? Would It have been the same without?

5. Well, I also had similar pictures in my mind, but it wasn't that solid of an image. So seeing those pictures in real life help me make a better representative image.

Did the images restrict you in any way or did it make the drawing process smoother?

6. Well, the images are very related to what I experienced therefore I wouldn't say that they were very limiting.

What was the first thing that came to your mind when sketching? Did you first think

about the memories or shapes you can draw?

7. I thought about the memory.

How challenging was it for you to express your emotions through a sketch?

8. Well, at first I couldn't think of anything but the pictures that you have shown to me really made a difference.

Do you feel that your sketch accurately reflects your initial emotional state or did any changes occur when you started drawing?

9. I was able to think more truly about that moment. And my emotions during that moment.

Did the AI generated images shown correctly depict what you were trying to convey?

10. Yeah, yeah.

Is there anything else you would like to share about your experience or any insights you gained from this activity?

11. Yeah, I would recommend this. A lot more people are probably like me, who doesn't think about the things that they do or encounter with in a day. So remembering these moments, through drawing, I think a lot of people could benefit from.

Would you consider making this a weekly habit?

12. Yes, of course. This took me like 5 minutes, even maybe less.



Second task explained

It was found that some people prefer using things like shapes, lines color blocks to represent their emotions. I want you to think of how you are feeling and choose shapes lines colors or anything you want. You can give a prompt of the emotion you want to convey and explain with with what

Given prompt: Draw my anger with shapes

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel.

Can you explain your drawing?

I draw an angry face and lines to make it chaotic and show the anger

Can you talk about this experience? Can you compare this to your previous experiences?

13. I believe the previous one helped me more compared to this one because I was able to think and put my emotions into a drawing with the first one. With second one I didn't particularly think about my emotions but rather I tried to make a good drawing representing my emotions.

What are the differences?

14. The first one is more personal second one was more general.

Which one would you prefer?

15. First one

Was it challenging?

16. No it was easy

Were the images helpful?

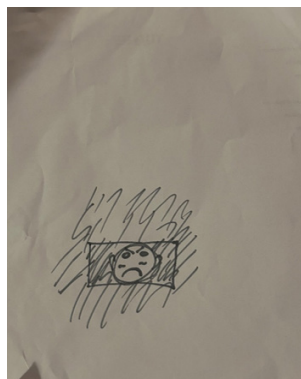
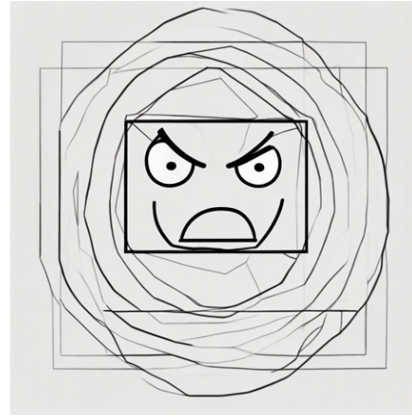
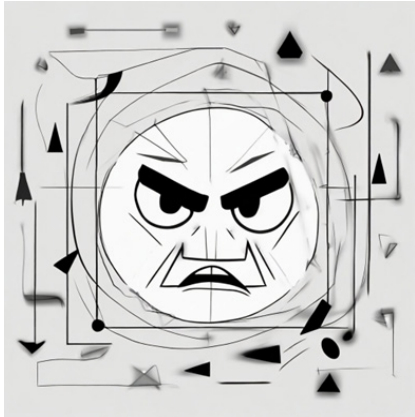
17. Yes.

What would you do with them after, would you share it or keep it private?

18. I would keep them to myself

Would it be different if you just talked to AI and I wasn't here?

Yes, of course I would be able to express myself more freely in that way



Participant 3

The aim of the interview and the goal of Mindsketch was explained.

What are some of your current daily habits and do you have physical reminders of these tasks?

1- I don't actually have an habits for every day of my life.

If I were to ask you sketch your emotions, what would you draw? Whould you be able to do it?

2- I can try (tried a little bit) . Actually I am a bit depressed and stressed right now about my studies and but I I don't know how to draw.

For AI to generate an accurate image that represent your feelings, I want you to first think about your day and think about the feeling you recall the most that you would want to express. To give the AI a better prompt I want you to say it like 'Draw this' so the AI can understand it better

- prompt "It's a rainy day, so I'm not in a good mood and today my exam is going to be graded. It's going to be published so I'm stressful, draw this."

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel.

Can you explain the drawing

3- The girl in the photo is me, she's standing in front of the window? It's a rainy day and in her left there is a bunch of books and her notes but instead of looking at them. She's staring to the window.

How would you describe your experience with this task?

4- I really liked it and I also like the AI inspiration thing because at first, as you noticed I haven't got any ideas of my feelings, how I'm going to sketch my feelings, but after you show some images. I got some inspiration and I draw them.

Did the images you were shown help you with the drawing? Would It have been the same without?

5- It helped me yeah. No it wouldn't have been the same without.

Did the images restrict you in any way or did it make the drawing process smother?

6- No, no. It didn't restrict me. As you see in the images you showed me, they are like similar, but they are not the same. So I also used my imagination.

What was the first thing that came to your mind when sketching? Did you first think about the memories or shapes you can draw?

7- I think the shapes,

How challenging was it for you to express your emotions through a sketch?

8- It was a hard thing. Yeah, it was a hard. Because, like, i don't do it much

Do you feel that your sketch accurately reflects your initial emotional state or did any

changes occur when you started drawing?

9- When I started drawing it, it's a bit changed. I feel like I'm more released right now

Did the AI generated images shown correctly depict what you were trying to convey?

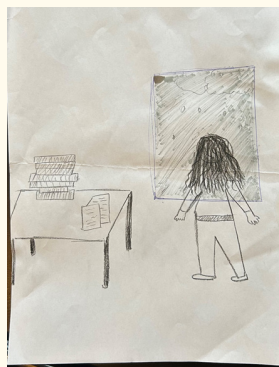
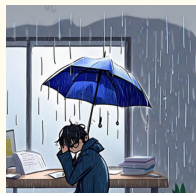
10- Yes

Is there anything else you would like to share about your experience or any insights you gained from this activity?

11- It was a nice experience

Would you consider making this a weekly habit?

12- Maybe not daily, but weekly yes.



Second task explained

It was found that some people prefer using things like shapes, lines color blocks to represent their emotions. I want you to think of how you are feeling and choose shapes lines colors or anything you want. You can give a prompt of the emotion you want to convey and explain with with what

Prompt " Draw stress with triangles"

Drawing explanation: I use triangles and I use intersecting triangles because I think just is something that never ends, and it's goes to deep.

Can you talk about this experience? Can you compare this to your previous experiences?

13- I think if you know that I draw this stress, this one was much more understandable.

What were the differences was it more challenging ?

14- It was easier than the first one.

Which one would you prefer?

15- I Prefer the second one.

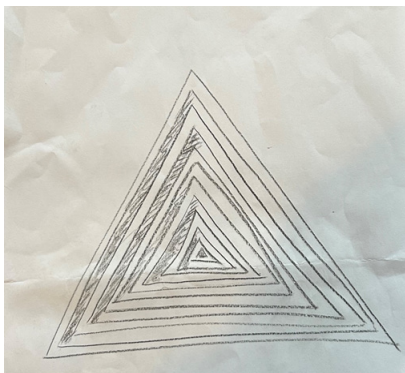
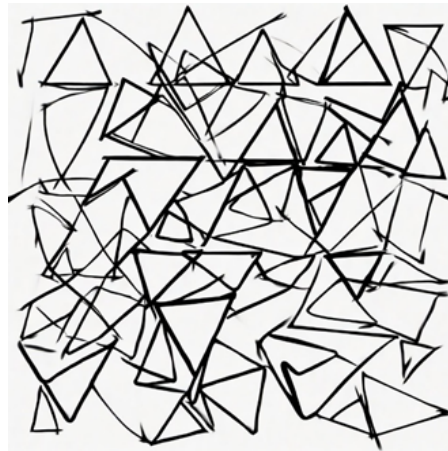
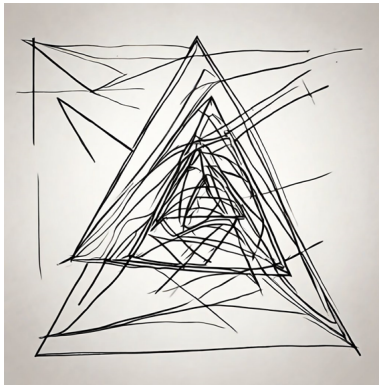
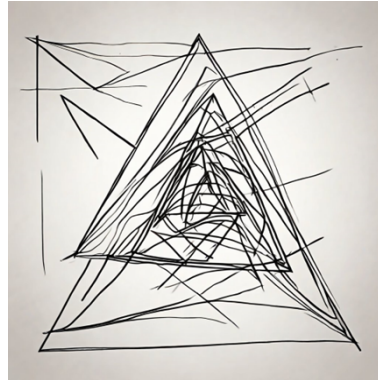
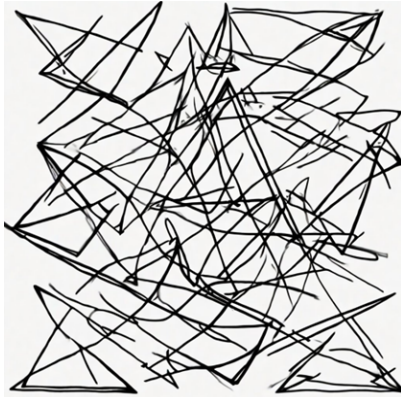
How differen't it would be if I wasn't there any you only had the AI?

16- I would have been expressed my emotions in more detail, maybe. If some-one is not there.

After you are done with drawings would you prefer to share them or keep it to yourself?

17- I don't like to talk about my feelings to people, so I would keep it





Participant 4

The aim of the interview and the goal of Mindsketch was explained.

What are some of your current daily habits and do you have physical reminders of these tasks?

1- I don't have a reminder. I'm doing everything by myself. I am my own reminder.

If I were to ask you sketch your emotions, what would you draw? Would you be able to do it?

2- In general, I'm really good at expressing my feelings. For example, when you look at my face, you can understand what I'm feeling, drawing them, it can be also useful but right now i have mixed feelings.

For AI to generate an accurate image that represent your feelings, I want you to first think about your day and think about the feeling you recall the most that you would want to express. To give the AI a better prompt I want you to say it like 'Draw this' so the AI can understand it better

- prompt: I met with a friend of mine. I was a bit nervous at first but then we had a fun night so I was feeling happy at the end of the day, draw this.

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel.

Ekin: Do i draw about this image, about this day or in general?

Elif: It can be about that day, but also just whatever you want to draw and how you're feeling.

Can you explain the drawing

3- I was thinking of a lot of things. In the drawing I'm confused like I have some concerns about school. I have some concerns about my personal life private life. Also, I can be in love. So right now very mixed feelings.

How would you describe your experience with this task?

4- It felt good because it was relaxing to draw my feelings. Like what is it inside my head. Like, I feel relaxed right now

Did the images you were shown help you with the drawing? Would It have been the same without?

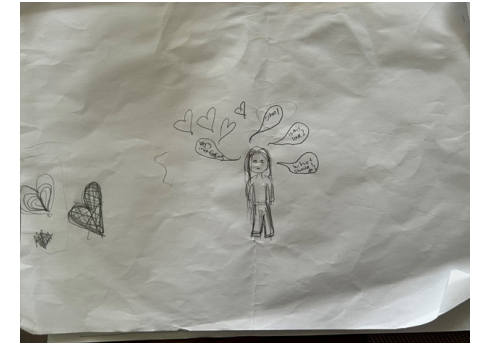
5- It didn't help me that much. That's how I feel right now and I draw that one so I don't need any example. (However it was observed that at first she was confused about her feelings and didn't talk much about what she would draw.)

Did the images restrict you in any way or did it make the drawing process smother?

6- No they didn't restrict me

What was the first thing that came to your mind when sketching? Did you first think about the memories or shapes you can draw?

- 7- I first thought about memories and then draw shapes.
How challenging was it for you to express your emotions through a sketch?
- 8- Since I'm not in an art class, it was quite easy. It was like a sketch so.
Do you feel that your sketch accurately reflects your initial emotional state or did any changes occur when you started drawing?
- 9- Well, in my drawing I also used text, so I think it's quite clear, what I'm feeling and
Did the AI generated images shown correctly depict what you were trying to convey?
- 10- Not specifically, I don't. Know not sure.
Is there anything else you would like to share about your experience or any insights you gained from this activity?
- 11- Nothing
Would you consider making this a weekly habit?
- 12- Yeah, I think it could be. It can be useful for me because it's like writing a diary. It's basically the same thing, but some people like feel more relaxed when texting or when drawing so. Yeah, I think it can be useful for me.



Second experiment

It was found that some people prefer using things like shapes, lines color blocks to represent their emotions. I want you to think of how you are feeling and choose shapes lines colors or anything you want. You can give a prompt of the emotion you want to convey and explain with with what

The prompt: draw happiness and excitement with shapes and colors

Drawing explanation: I wanted to make a heart basically. It is filled with like red circles. And like I wanted to show my excitement with like lines, you know.

Can you talk about this experience and can you compare it to the previous drawing session?

13- For me, there is no huge difference between like this one and the previous one like. It's good for me to make sketches for showing my feelings like it feels you know, relaxed.

So you didn't realise any differences between ?

14- It's basically the same for me. I think for for people who are having difficulty in sketching or drawing. This can be a good option because like you can use colours, shapes. I think this can be useful for these people, but for me there is no difference.

Which one would you prefer?

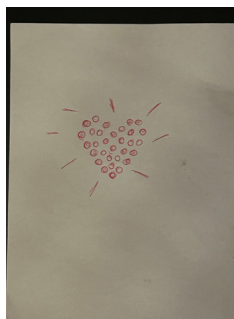
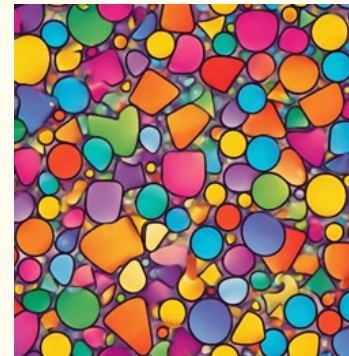
15- I mean, I prefer this one. It's the easiest.

How differen't it would be if I wasn't there any you only had the AI?

16- For me, It will be the same.

Would you share the drawings you made with others, or would you keep to yourself?

17- I think I will keep it as a secret, you know. I will keep it for myself



Participant 5

What are some of your current daily habits and do you have physical reminders of these tasks?

1- I don't know. It's just like how I place things in my room. Like sometimes I might forget to brush my teeth. But if I place my toothbrush next to my skincare. I'll do like, right after my skincare. Like sometimes I forget to take my vitamins and I put them next to my door so that when I go I'm like Ohh right. And then I take them.

If I were to ask you sketch your emotions, what would you draw? Would you be able to do it?

2- I think I could draw something also because I just saw a guy that i really hate walk through that door. So I could literally draw something (so she said she could draw because she was feeling an emotion in the moment)

For AI to generate an accurate image that represent your feelings, I want you to first think about your day and think about the feeling you recall the most that you would want to express. To give the AI a better prompt I want you to say it like 'Draw this' so the AI can understand it better

(There were too much explanation and AI didn't pick up most this shows that we whether need to give better explanations of what they tell to AI or show that its still okay if AI doesn't pick up the whole text)

- prompt: My day was good. First I woke up and I stayed in bed kind of long, but then I pushed myself, motivate myself. Listen to some good music and then I was motivated. I arrived on campus and we had a dynamics lecture and I realized that I love dynamics so I was in such a good mood. I understood all the lecture and everything clicked in my brain I was like I love it. Yeah, I came here ate lunch. And then I saw this guy and now I feel angry, draw this

Can you explain the drawing

3- This this is me in my bed this morning. I had a dream and I woke up. I was so happy it was not real. I draw the comfort of the bed, then happy in lecture and seeing my friends and then seeing this guy and then obsessive thinking kind of came back

How would you describe your experience with this task?

4- I liked it. It's like it made me think about why I was feeling like this and then finding ways to represent it in a nice way .

Did the images you were shown help you with the drawing ? Would It have been the same without?

5- They helped me for the beginning, but then they didn't really show everything I was feeling feeling. They focused on the first part, so then it helped me for the beginning and then I got inspired by it.

Did the images restrict you in any way or did it make the drawing process smother?

6- Yeah, he kind of did (restrict), because in the beginning I didn't know where to start, and I saw that. So I was like, ohh yeah, it makes sense that start like this. But I didn't take time to think about how else I could start.

What was the first thing that came to your mind when sketching? Did you first think about the memories or shapes you can draw?

7- At first I thought about the memories and then how it made me feel. And then like, what shapes and how could I, you know, draw it so that it represents it the best.

Was it challenging for you to express your emotions through a sketch?

8- Kind of kind of. No, that part was not because it's Just people like (Where she draw people) but this part was , showing the feeling of my comfort was.

Did the AI generated images shown correctly depict what you were trying to convey?

9- Just a part of it because I felt so many things

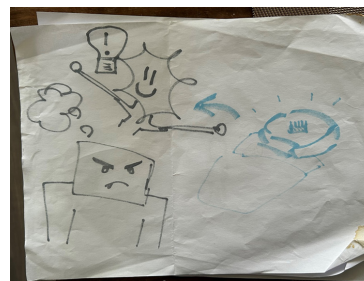
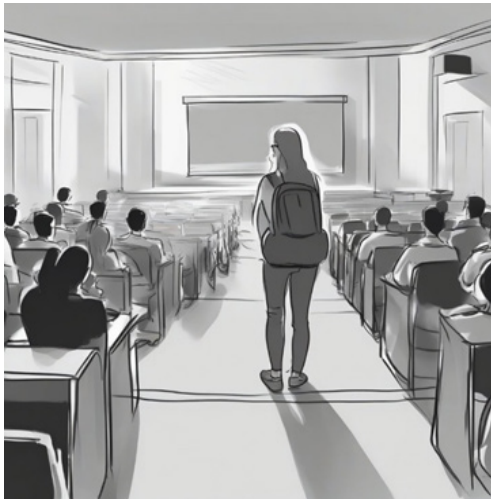
Is there anything else you would like to share about your experience or any insights you gained from this activity?

10- Nothing'

Would you consider making this a weekly habit?

I think so, because I really like drawing and I don't do it often since I don't have time, but I think it would really help me like handle stress and emotion





Second experiment

It was found that some people prefer using things like shapes, lines color blocks to represent their emotions. I want you to think of how you are feeling and choose shapes lines colors or anything you want. You can give a prompt of the emotion you want to convey and explain with with what

Prompt: 'I would like to draw circles and lines into each other showing confusion'

(4 images shown for 10 seconds) Now reflect on your emotions again and just draw how you feel.

Sha said: Ohh that's really good. Ohh I like it.

Can you explain the drawing

It's basically you see the triangles. Those are my ideas and they kind of look organised to me, but to the others, they're not. Because you see, like, the things here, it's kind of like messy and everything. But for me, if there's like a path you know.

Can you talk about this experience? Can you compare this to your previous experiences?

12- It was so much better because, like the previous drawing, the AI showed like real situations and it was not very intuitive to me because it was realistic, you know, but here it gave me more example of what I could express and it was really nice because I was like, Oh yeah, that's actually what I was like, that's actually what I was thinking and its the perfect representation.

What are the differences?

13- It was like less realistic cause before it was too realistic and you can't really draw that, except if you're like a professions and this was more connected to emotions, I guess.

Which one would you prefer?

14- I would prefer second one

Was it challenging?

15- It was less challenging than the first time. The first time didn't have really much inspiration. And the AI didn't really help, but here it really gave me inspiration .

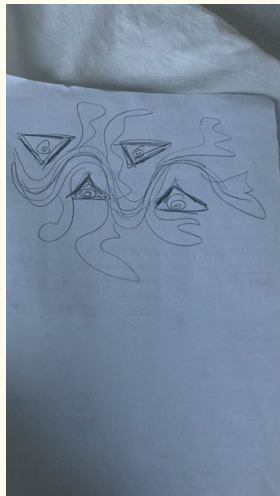
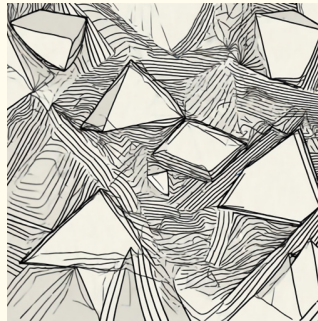
Would It be different if you just talked to AI and I wasn't here?

16- Well, I guess it would be more private and maybe it wouldn't understand everything I mean. I don't know. Cause maybe when you speak the in the sentence it picks up, it picks up the wrong words and maybe it gives you the wrong image

Elif: It's going to be the same like this one.



What would you do with them after, would you share it or keep it private?
 17- I think I could use them like, imagine I had a strong feeling or I had a dream and I can't really express what was happening and what I felt during the dream, but it was really important, for example, it was concerning my boyfriend. I want to explain it to him, you know. So I could maybe use it to be like, oh, this is kind of how I felt and then show him the drawing



Appendix B

Prompts for midterm code

1. Happiness/ joy:
 - Symbols: Smiles, bright colors, suns, rainbows, hearts, flowers, and open postures.
 - Techniques: Use warm and vibrant colors, create a cheerful and lively composition, and depict people or animals in joyful poses.
2. Sadness:
 - Symbols: Tears, rain, dark and muted colors, slumped or closed postures (someone covering their face with hands, and gloomy landscapes.
 - Techniques: Employ shading and hatching to add depth, depict solitary figures, and use cool colors to convey a sense of melancholy.
3. Anger:
 - Symbols: Fire, jagged lines, clenched fists, red color, aggressive facial expressions, and sharp edges.
 - Techniques: Use bold and intense lines, create a cluttered and chaotic composition, and employ red and other warm colors to evoke anger.
4. Fear:
 - Symbols: Shadows, dark corners, trembling, wide eyes, creepy creatures, and broken lines.
 - Techniques: Emphasize contrast with light and dark areas, create a sense of uncertainty and tension in the composition, and use cool colors to represent fear.
5. Surprise:
 - Symbols: Exclamation points, raised eyebrows, wide-open eyes, dropped objects, and gasping mouths.
 - Techniques: Focus on capturing the exact moment of surprise, use exaggerated facial expressions, and employ bold lines and bright colors.
6. Love:
 - Symbols: Hearts, embracing figures, hand-holding, intimate scenes, and soft, romantic colors.
 - Techniques: Use flowing lines, create a harmonious composition, and incorporate warm and tender colors to represent love.
7. Disgust:
 - Symbols: Grimaces, squinted eyes, wrinkled noses, vomit, repulsive objects, and sickly colors.
 - Techniques: Depict contorted facial expressions, use rough and irregular lines, and apply unsightly colors to convey disgust.
8. Confusion:
 - Symbols: Question marks, tangled lines, mazes, abstract shapes, and blurred elements.
 - Techniques: Create a sense of visual complexity, use overlapping and intersecting lines, and incorporate muted or mixed colors to represent confusion.
9. Excitement:
 - Symbols: Exclamation marks, fast movement lines, dynamic poses, and bright, energetic colors.
 - Techniques: Use bold and dynamic lines, create a sense of movement and action in the composition, and apply vibrant colors to depict excitement.

Appendix C

Survey 2 answers (https://docs.google.com/forms/d/1ys2jgC5lRiNGP4zT4C_vpVfpiRXdnsGRCebL-5Xp46E/edit)

Problem space

Mindsketch aims to use AI in motivating people to reflect on themselves and express their emotions. Our project tries to make opening up and expressing your emotions more accessible, as bottling up those emotions can threaten your mental health. The people we want to reach are young adults. This is because they experience the most significant life transitions, such as starting a new career, moving to a new college or making new social circles.

Concept explanation

To get people to open up more, we created a way of visualizing bottling up the emotions. We came up with 2 design decisions that has the same concept.

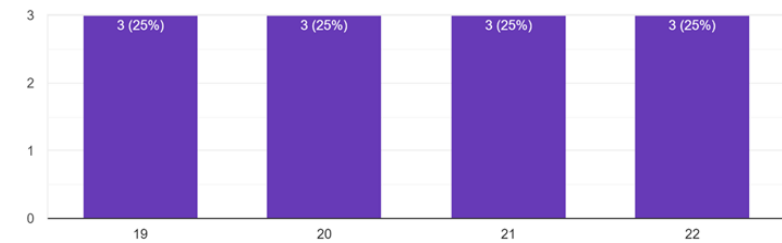
Design 1: Envision a small device that you carry with you throughout the day. This device allows you to record your emotions by pressing buttons associated with specific feelings (e.g., red button for anger). These button presses are linked to a box or bin, likely situated in your room. The box (when you turn it on) responds to the buttons by dropping colored balls, each representing an emotion you recorded during the day. If you don't wish to reflect on these emotions, you can throw the corresponding balls into the bin. When the bin is full, the box opens up meaning that its time to talk about your emotions. When user talks about their emotions AI creates an art representing these emotions

Design 2,: The same small device is used to record your emotions throughout the day by pressing buttons. However, in this case, the box has a display on that visualizes your emotional journey as a graph animation. The graph represents the range and intensity of your emotions during the day. When the graph fills up, the box opens as a signal that it's time to address and open up emotionally. The user follows the same path, talking to AI and AI creating an art



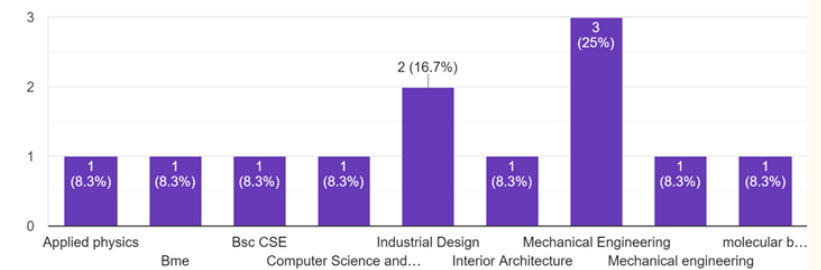
How old are you?

12 responses



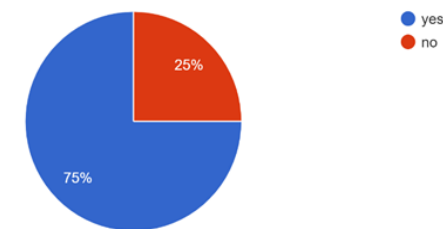
What is your major?

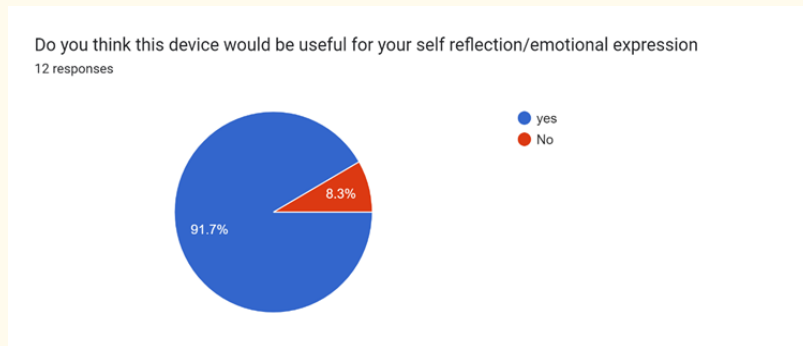
12 responses



Would you use an AI powered device that you talk about your emotions to that creates drawings of your emotional explanations

12 responses





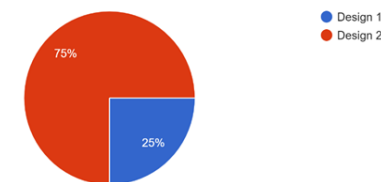
Can you elaborate on why?

- It's easy to forget about your mental health when you're under a great deal of stress, although that is exactly when you should do it. Having any form of device that would remind me about it is good enough.
- Sometimes people might not want to use words to show how they feel but they show them with their actions. Those actions might sometimes effect someone else so drawing might be a more friendly way to show the emitsons
- I can't see why this would be useful
- It might be useful to see some patterns of my emotions during the day and also the overall picture. Maybe then you can trace those patterns to some unobvious events that might happen regularly during the day.
- Some people tend to keep their emotions inside and have a hard time expressing them to somebody else. This product can help people release these emotions and talk about their feelings. The created image by AI will be directly about what the user has experienced, therefore it will help on a more personal level.
- Witnessing an interpretation of AI about my feelings would help me either realize what I am actually feeling through the words I use or validate my emotional journey as it would be more objective than me who is experiencing it.
- It would be perfect when you can't explain yourself clearly
- I feel like this device could help me reflect on my feelings, therefore helping me inderstand them better
- I think in hard times trying to use it would help me a bit to start thinking about it better



- I think it can be helpful for certain people because sometimes explaining your emotions are hard and an ai could be helpful
 - I think for me and people in general making them more aware of what they feel can lead to them being able to act better and find ways to improve themselves
- What would you feel about creating an AI generated drawing with your words?
- Don't have any spectacular opinions about this. As long as it's easy to use I'm good.
 - It would be an interesting experience
 - This already exists
 - Very suspicious about the quality and the purpose of the image. But it might have some interesting results.
 - That would make me feel relieved and relaxed.
 - Supported
 - I think that would be really helpful
 - I think it is a creative idea to help express emotions
 - I think it would be nice
 - Its fun to create images with ai and i think this can be a good application for it
 - It'd be ok
 - I think it is always nice to have a visual of my emotions during the day.

Would you prefer to use Design 1 or design 2 (explanation at the top)
12 responses



Can you explain why

- As the creators, you'd have much more flexibility going with the second design, as you can customize the graph however you'd like if it's on an app/web-site. One example would be making a version tailored for smaller children, thus encouraging healthy emotional habits from a young age. For me, it depends on how much space the first design would take up physically, if it's not too big I might also be fine with that. However, having to physically do it may eventually turn into too much of a hassle when I'm really stressed and I might just avoid it, whereas my laptop is almost always open, even if it's just playing background music when I'm cooking or working out, so it wouldn't be hard to switch to an app/website for this project. To that purpose I think making the whole process as simple and coherent as possible is the best option.
- It is more digital and requires less work
- To be honest i wouldn't use either of them but the first one seems more interesting
- The second design seems to display additional information by adding two extra axis: the time and the intensity. So it might be better for identifying certain attributes that depend on those two axes.
- I could feel the emotions and their intensity better through an animated motion video.
- I would love to see the journey more than the accumulation of feelings



Appendix D

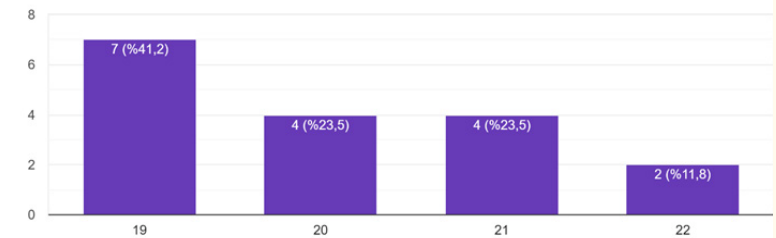
Survey 1 responses

Quick explanation about our concept:

Mindsketch aims to use AI in motivating people to reflect on themselves and express their emotions. The expression will be conveyed by users through drawing and sketching. Our project tries to make opening up and expressing your emotions more accessible, as bottling up those emotions can threaten your mental health. The people we want to reach are young adults. This is because they experience the most significant life transitions, such as starting a new career, moving to a new college or making new social circles.

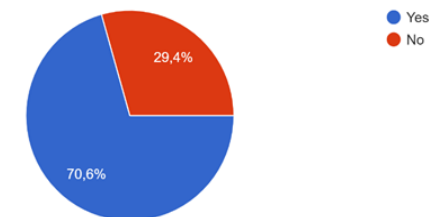
What is your age?

17 yanıt



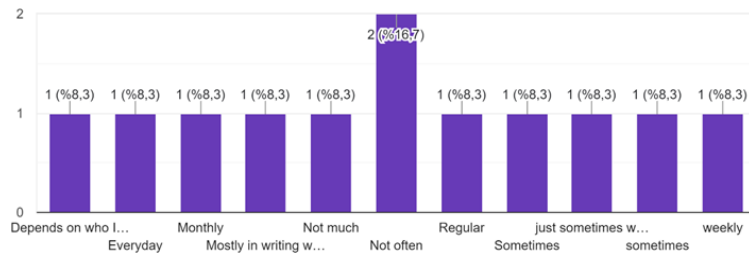
Do you sometimes struggle expressing yourself?

17 yanıt



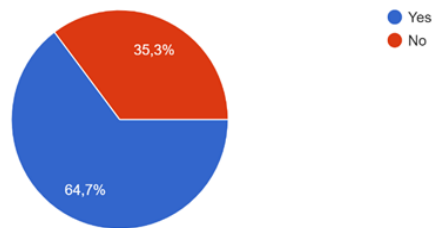
If yes, how often?

12 yanıt



Do you think drawing those emotions will help you express yourself?

17 yanıt

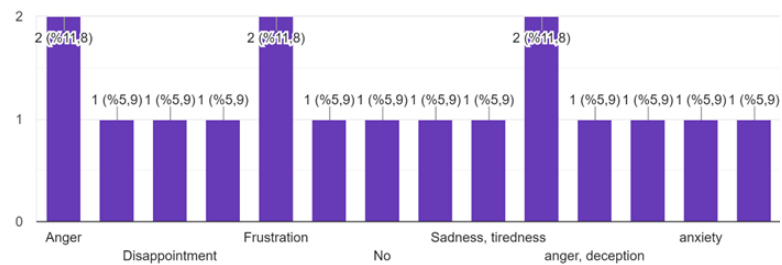


- It might let my inner thoughts and feeling which I did not realize or had unconsciously
- sometimes it's easier to write or draw your emotions bc you don't need to say them out loud or to others
- Colors, poses and other types of visualizations can help people see things from your perspective.
- I find it even harder to express myself in drawings.
- I'm not good at it
- Sometimes saying thing out loud can be hard, so drawing them can be helpful to express yourself
- Personally I would like to keep my emotions to myself, instead of showing them freely. So that I do not something weird because of the emotions. I prefferably are more rational with it.
- I think drawing can make us see whats lacking when expressing ourselves
- it'll because art is a better way to express yourself than talking or any other stuff
- I'm not the best at drawing
- I am very creative so drawing would help me evacuate those emotions in a fun manner
- If you feel frustration about something, you can ofcourse talk about it. But to me it could be interesting to express this in a more visual way like in the description. Perhaps it could be interesting to see how people will look back at these drawings. Does the drawing reignite negative emotions they felt? Or does it allow people to see the emotions they are feeling are relative?
- It visualizes it
- It's easier to explain emotions with words



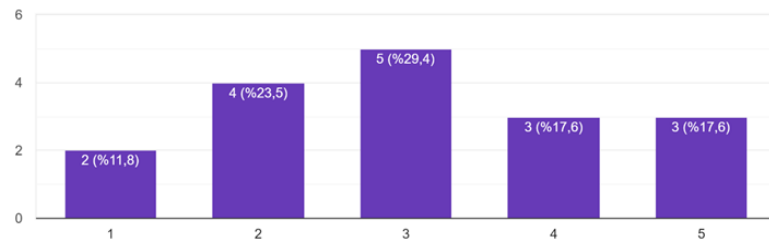
What emotions do you feel when you have trouble expressing yourself

17 yanıt



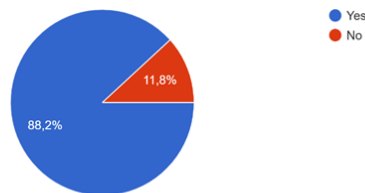
How likely are you to use a digital platform that uses AI to assist in expressing and reflecting on your emotions through art?

17 yanıt



Would you find value in a tool that guides you in self-reflection through creative activities like drawing?

17 yanıt



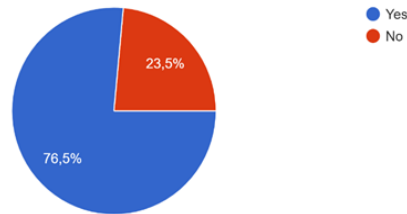
In what situations do you usually feel the need to express or reflect on your emotions the most? (e.g., new job, new relationships, major life changes)

- When I have hardship in my school or work. And when I have arguments with somebody.
- friendships and relationships, and also work
- When in arguments
- At the beginning of my relationships
- Usually in stressful situations, like university-related stress or family drama.
- Writing PDP.
- Major life changes
- when i fail at something
- I personally do not feel the need to do this, but I can imagine it being a very interesting tool to help specifically children to express their emotions. Especially children with a disability.
- New relationship
- Relationships
- major life changes
- relationship problems (friend and family)
- Family conflicts, reflecting on the future
- Relationships
- When your at a low point in life



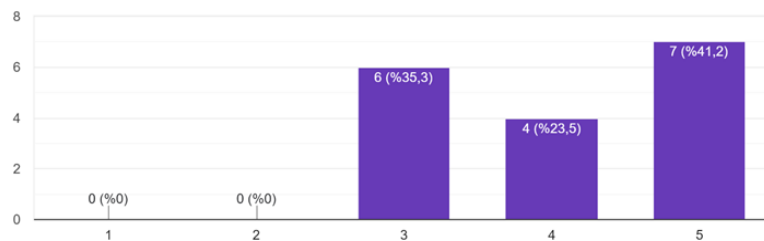
Would you be more likely to use an AI-driven tool to express your emotions if it offered various drawing prompts or exercises related to your current life situation?

17 yant



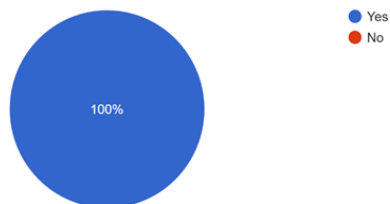
How likely are you to recommend Mindsketch to a friend who might benefit from expressing their emotions through art and reflection?

17 yant



Can we use your answers for our research?

17 yant



Appendix E

Meeting with Flip Loyeen notes:

Currently art teacher at University of applied sciences Utrecht , worked for 33 years as an art therapist

- It is interesting to see all these new possibilities
- He talked about his students that made drawings of the nature and of their home and they made a book out of it looked over to analyze their emotions.
- He said people in therapy sessions are usually confronted with blank page fear and this is a problem for everybody even for artists who are in therapeutic sessions.
- The goal is to get the 2 parts working together, artistic part and
- If somebody is blocked and can't create something then they try to bring in games to help them start on something

Some possible risks

The fear for me that AI produces beautiful paintings and its perfects that users feel intimidated by that. They might feel intimidated when they want to bring that feeling to paper (I explained that we try to make it clear that this tool is for inspiration as much as we can, he said he understood)

One problem is that It could also not apply to what to their feeling completely,(I explained that even in those circumstances people were able to succeed in drawing about their emotions)

'You must bring it with you over the years It is very interesting, I will talk to an art professor at university of Utrecht , there is also a teacher that is developing a laboratory for new media so I think these people could be really interested in what you will find.' (he said he would talk and let me know)

He found it similar to one of his works: he had a box with postcards and the postcards were only art cards he made patients choose some cards that connected to their feeling and they were able to make a draw easily

He said a study like ours were made where people draw while using vr glasses. He said Vr glasses are also good but the problem is , that you have to have your glasses on all time, it makes people less connected to real word. He said our project brings back the body experience

He found having it on the wall great,' I love it very much'



Appendix F

Interview 2 responses + questions

Questions:

- Do you regularly respond to your notifications that aren't social media apps?
- Are you more likely to go and make your bed if you get a notification that it is not made or if you see that it is not made?
- Would you prefer to draw on your phone or on a bigger screen?
- What habits do you have right now other than basics?
- How did you build this habits?
- Are there any apps that you have habit of using other than social media apps?
- Do you use meditation or therapy apps? Why not?

Reponses:

Participant 1.

Yes

Have a notification

Bigger screen

Drinking water when I get notification and drawing

I formed them from childhood

Drinking water when I get a notification from the app

No, I'm stressed but I don't feel the need to use those apps

Participant 2.

No, I do not respond to app notifications

If I see that it is not made I will be more likely to make it

Bigger screen

Work on school and sports

School is requirement and sports is something I started when I was young

No I don't think so

I have no motivation to use it but I would like to download

Participant 3.

No I do not respond to app notifications

If I see it I will make it

Bigger screen

Checking emails and sports

Sport is something I started when I was a kid

No I don't think so

I used to have one but it was not as much of a habit as I wanted it to be

Participant 4.

No

I would hate notifications so if I see it

Bigger screen

Journaling

I started doing it but sometimes I skip it and then the need comes in when I am overwhelmed

I use reading apps

No, because they do not work (for me)

Participant 5.

No

If I see that it is not made

Bigger screen

Gym

Other people encouraged me

Games

No, meditation is cringy in my opinion and I have had therapy but in person works better for me

Participant 6.

No

If I see it

Bigger screen

Sports

I just went to my mandatory training

No, I used to have games, but it got boring

No, I cannot find myself to make it into a habit and delete it out of boredom

Participant 7.

No

If I see it

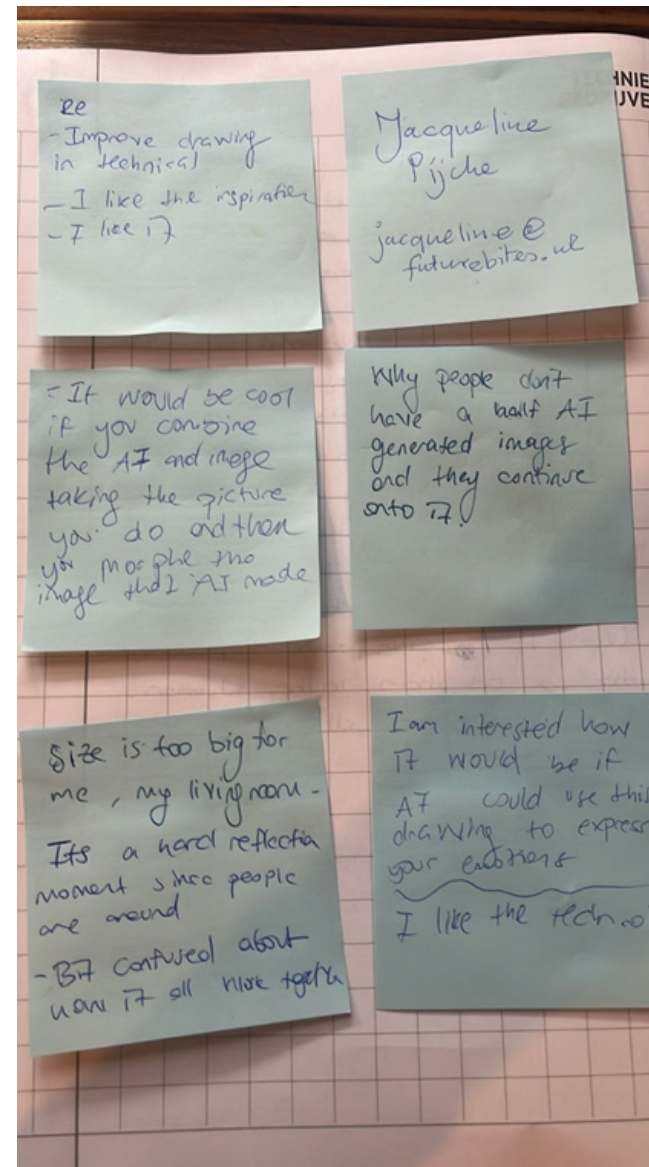
Bigger screen

Reading



I have the book in front of my bed which reminds me every night before I go to sleep
 No
 No
 Participant 8.
 No I am really bad at that
 More if I see that it's not made
 Bigger screen
 Going to gym
 I was motivated by my peers I go with them and its intrinsic motivation
 I use notes app and calendar but Im really bad at keeping up with notifications
 I do
 Do you keep up with notifications?
 No but I wish I would love to.
 Participant 9.
 Yeah I think so
 Notifications because I already see it and don't take action
 Bigger screen definitely I don't like it when I need to draw with phone or small tracing pad of laptop
 Leaving my room tidy
 Realization when I started living alone and when my roommates could see my mess
 Yes I check the news app daily
 No I have my own ways of dealing with it

Appendix G



Why not an app?

- + I wouldn't have had space for this in my room.
- + Cost is very important
- + Why would they purchase?
- +

+ I got the concept

- + It feels a bit disconnected
- + maybe draw something on drawing?
- + maybe a certain color palette is generated.

Headspace → maybe 20 euros a year is even expensive.
 + How much would it cost?

First you had image being enhanced

- + How do you afford?

It is interesting but you have to work on the interface

+ Continuing to draw it on the AI image and AI can help you draw more

- + More fluid tools

Demo day 15 december 2023



Sometimes drawing is enough to feel better. I feel like the people didn't fit very well, so maybe you can think about a screen that allows the user to appear the people/generate a new image that better fits the mood.
 But overall it's really nice! I'm really curious about the next steps, so remember to justify the choices in the report.

It incentivised me to think about how I am feeling

→ I really liked that you found a solution to a problem that is ~~xxx~~ in daily life. I find that a lot of feel the emotions but have a hard time actually explaining them and this can be a good practice to get used to learn how to read and express your emotions in a different way.



Nice idea, to let the picture reflect your thoughts / feelings and at the same time be a way to ~~communicate~~ express your emotions. Lots of people find it difficult to talk about feelings, so this is an opportunity to make it visible and accessible to use. I can imagine for students it can work as it's easy to use. Walking with people in the forest I ~~was~~ used to use the same metaphor, and it really works! Good luck, Doull.

Thinking: it might help if you will enclose something for students to feel seen / heard, like a tip / ~~quote~~ quote, some "surprise" effect that can help them in their situation. In this case they will probably return.

